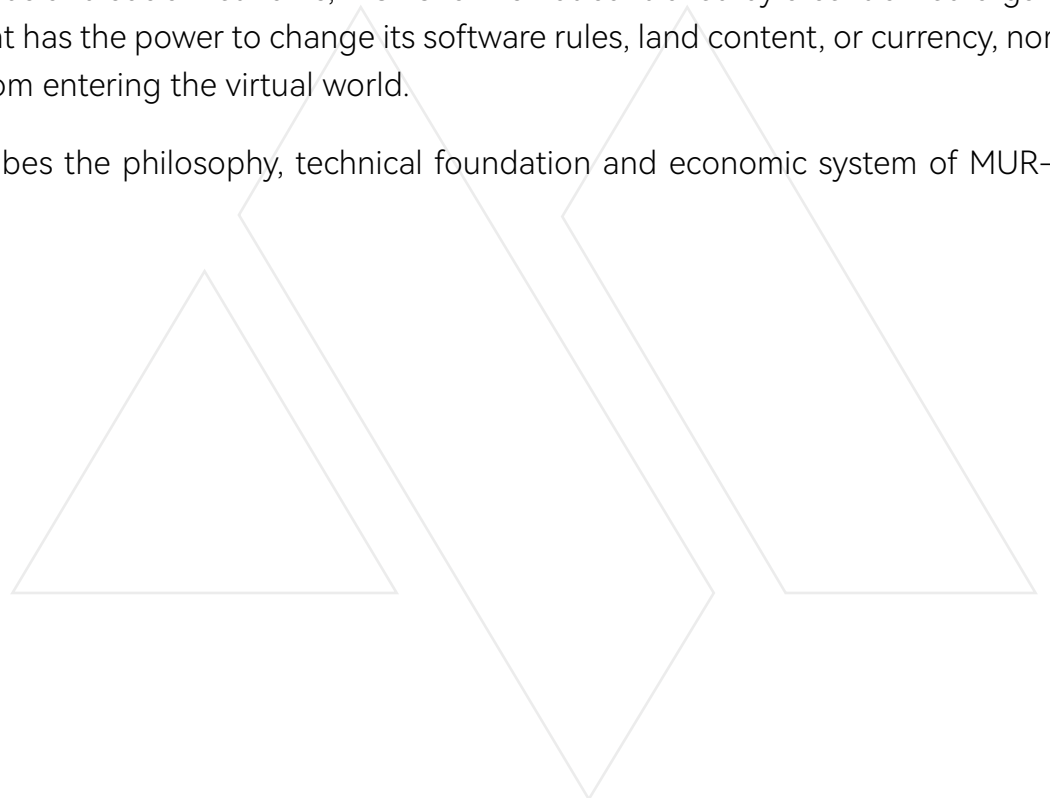# MURChain

MURChain

Whitepaper

BEYOND THE WORLD

Abstract

MURChain is a distributed virtual platform where users can browse and discover content, interact with others and entities. Users can also claim ownership of virtual assets through a block-chain-based digital ledger. These virtual assets are owned by MUR, and their owners can decide how to use and benefit from these assets, ranging from static 3D scenes to interactive systems like games. In MURChain, virtual assets are unique, transferable, and rare digital assets that can be bought and sold using the MUR ERC20 token. Additionally, MUR can be used to purchase digital goods and services in the virtual world.

Whether it's entertainment or work, people are spending more and more time in virtual worlds, but these activities are mostly done on 2D interfaces like web pages and smartphones, while 3D worlds add an immersive element and bring content closer together, bringing different communities together more realistically.

Unlike other virtual worlds and social networks, MURChain is not controlled by a centralized organization. No single agent has the power to change its software rules, land content, or currency, nor can it prevent others from entering the virtual world.

This white paper describes the philosophy, technical foundation and economic system of MUR-Chain

Brief Introduction

MURChain provides infrastructure support for a shared virtual world, known as the Metaverse. MURChain includes a decentralized virtual asset ownership ledger, a protocol that describes the contents of each virtual asset, and a peer-to-peer network for user interaction.

Principle

The growth of large private platforms like Facebook and Steam has enabled hundreds of millions of users to gather, interact, share content, and play games. This network effect has led to the emergence of numerous online communities and game companies. These platforms, controlled by centralized organizations, manage the rules and content flow of the network, and generate substantial profits through the communities and content creators on their platforms. For example, Steam takes 30% of its revenue from game sales and 5% from user transactions. MURChain aims to create a network where content creators can fully own and benefit from the value of their work.

The MURChain team began this project in 2015, when cryptocurrencies were just emerging and the blockchain infrastructure for consumer-oriented platforms was still underdeveloped. Since then, user adoption and infrastructure development have grown at an explosive rate. For instance, by July 2017, Coinbase had amassed 8.4 million user accounts, half of which were created in the past year. This rapid user growth provided a substantial user base, fueling the development of decentralized commerce in virtual worlds like MURChain. Today, while blockchain infrastructure (with Ethereum as a pioneer) is becoming more widespread, the lack of an efficient and fast method for small transactions has hindered the growth of online commerce.

As a global, low-cost instant payment method, cryptocurrencies are still evolving. To achieve short to medium-term scalability in the blockchain payment network, payment transactions must also occur off-chain. Solutions such as Bitcoin's Lightning Network and Ethereum's State Channel are poised to enable low-cost, global, and fast payment systems.

Now, more decentralized solutions are emerging that, while they may lose operability, privacy, and standards with other systems, are feasible. MURChain is based on the premise that low-cost direct payments between content creators and users will revolutionize Internet commerce.

History

MURChain initially served as a proof-of-concept for allocating digital real estate ownership to users on the blockchain. These digital properties were initially pixels on an infinite 2D network, each pixel containing metadata that indicated the user's ownership and displayed the color of the pixel. This phase was referred to as the' MURChain Stone Age.'
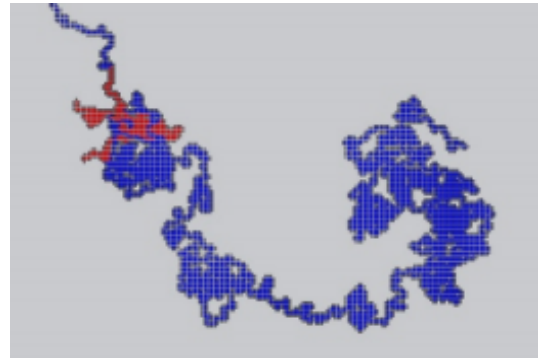
Figure 1: Stone Age.

At the end of 2019, the MURChain team began developing Copper Age, a 3D virtual world composed of numerous plots. Landowners can link their virtual assets to a file's hash through a modified Bitcoin blockchain. Using this reference, users can download files containing land content, which define the models and textures that will be displayed at each location, using a distributed hash table (DHT) and bitstream while exploring the virtual world.

We placed the first visitor in the world at MURChain.org/world. Anyone interested can run a node, download and verify the blockchain, and explore the virtual world according to advanced instructions.

Figure 2: Bronze Age.

The next version of MURChain, —— Iron Age, will create a social experience through an economy driven by existing land ownership and content distribution. In the Iron Age, developers can create new applications on the MURChain platform, distribute them to other users, and profit from them. The Iron Age will implement peer-to-peer communication, a script system that supports interactive content, and a fast payment system for cryptocurrencies in virtual world transactions. The communication layer is crucial for the social experience, offering services such as location, posture, and voice chat. MURChain achieves this technology through a P2P network. The script system will serve as a tool for landowners to describe the behavior and interactions of 3D objects, sounds, and applications on their land. Lastly, a low-cost payment system is a key technology for developing the economy in the rapidly evolving virtual world.

A world of freedom
of movement

The land on MURChain is closely connected, a feature that distinguishes it from the web domain. New plots must be adjacent to existing ones. This characteristic facilitates the discovery of new content spaces and allows for the reservation of space for special themes or regions. While web pages can have an infinite number of hyperlinks to other content, the adjacent areas of plots on MURChain are limited. Additionally, content on adjacent plots can be seen from a distance. For content creators, establishing a region can help achieve target traffic; for end users, this makes exploring thematic areas more convenient. Users can access neighboring areas and interact with applications they discover by chance.

The principle of adjacency and the concept of infinite land are at odds: in such a scenario, it's not easy for users to navigate through the land to find relevant content. However, if the land is finite, developers can attract users by purchasing high-traffic areas. Consequently, a secondary market for buying, selling, and leasing land will develop.

The economic foundation of the virtual world

The value proposition of MURChain to app developers is that they can get all the benefits of their own app and the economic interaction with users. For this economic interaction to happen, MURChain must allow the exchange of three things: money, goods, and services.

MURChain will integrate a core system that will enable any two users on the Internet to complete global, low-cost instant payments. Cryptocurrencies have opened up trustless payment channels for all parties, and now a low-trust radial system has become a reality.

For the services provided on MURChain, we are developing a script system that enables developers to write interactive programs between users and applications. This script system runs exclusively on the client side but supports a variety of data flow models, ranging from simple local effects and traditional client-server architectures to P2P interactions based on state channels. The advent of blockchain smart contract encryption technology has enabled developers to benefit from advantages such as low-cost, fast small transactions, verifiable fair games, decentralized storage, and more.

To facilitate the trading of virtual goods, economic incentives are necessary to ensure the continuous creation and release of avatars, items, and scripts. Given that static content can be easily replicated, enhancing user experience should foster a social consensus that recognizes the originality of content. An identity recognition system would enable users to track and verify through encrypted signatures whether a piece of content has been approved by the original creator. Some innovative practices, such as Rare Pepes, are already being implemented.

Usage Scenario

Apply

MURChain's scripting language supports the development of applications, games, bets, and dynamic 3D scenes. The scripting language has a wide range of capabilities, including creating objects, loading textures, processing physics, and encoding user interactions, sounds, payments, and external calls.

Content curation

MURChain users will cluster around neighborhoods with shared interests. Choosing their virtual assets around high-traffic centers can drive users to use content posted by the owners of those virtual assets.

Advertising

Brands can use billboards on or near high-traffic sites to promote products, services and events. Some neighborhoods could become virtual New York Times Square.

Digital collectibles

We want users to be able to publish, distribute, and collect rare digital assets issued on the blockchain. Just as they do in other virtual worlds or online forums, these digital assets can be traded in MURChain through a scripting system, with the previously mentioned naming system as support.

Architecture

The MURChain protocol is divided into the following three layers:

- **Consensus layer**

  Trace ownership of virtual assets and content within virtual assets

- **Virtual asset content layer**

  Use a decentralized distributed system to download assets

- **Real-time layer**

  Allow visitors in the user world to communicate with each other

The ownership of virtual assets is established on the consensus layer. On this layer, the content of virtual assets is referenced using the hash value of the file content. Based on these references, users can download the content from a bitstream or IPFS. The downloaded files contain descriptions of items, textures, sounds, and other elements needed to present the scene. Additionally, the files include the URL of the rendezvous server, which facilitates communication among P2P users exploring together.