Statement: This project is not open to mainland China due to regional regulations

聲明：鑒於地區法律本項目不對中國大陸地區開放，項目中採用簡體中文是為了方便新加坡等東南亞簡體中文應用區觀看

SharkMen

PROJECT SOLUTIONS

In the vicissitudes of the meta-universe, we aim to create a reasonable platform to fill a better parallel space with more true feelings and experiences

Technical white paper：技術白皮書（B）

聲明：鑒於地區法律本項目不對中國大陸地區開放

SharkMen

Technical white paper： 技术白皮书

At present, the residual value generated in the known smart contract is often ignored, but there is a lot of reusable value in it. Through the intelligent encryption technology of blockchain, it can effectively link to the residual space generated by each residual node on the Internet of things and the residual value existing in the space that may not be used. It's like a harvester. In the vast Internet of things, repeatedly search the surplus value of each transaction. It should be used repeatedly. It is the most efficient use of the residual value generated in each blockchain within a space.

目前，已知的智能合约中产生的剩余价值往往被忽略，但其中蕴含着大量的可重用价值。通过区块链智能加密技术，可以有效链接到物联网上每个剩余节点产生的剩余空间以及空间中存在的不可利用的剩余价值。它就像一台收割机。在浩瀚的物联网中，反复搜索每笔交易的剩余价值。它应该反复使用。它是空间内每个区块链产生的剩余价值的最有效利用。

SharkMen

At present, every node in the blockchain has similar problems. We usually think that the extra River losses generated in the process of each smart contract transaction are only part of the miners' costs and the combustion of the contract itself. In fact, this is only part of the losses. In fact, most of these fees are diluted by the space of the Internet of things itself in the process of my transaction. And the side that produces these expenses is what we call surplus value. These residual values exist in every part of the Internet of things. It's full of cyberspaceThis is also our loss in the trading process.

目前，区块链中的每个节点都存在类似的问题。我们通常认为，在每个智能合同交易过程中产生的额外河流损失只是矿工成本和合同本身燃烧的一部分。事实上，这只是损失的一部分。事实上，在我的交易过程中，大部分费用都被物联网本身的空间冲淡了。产生这些费用的那一方就是我们所说的剩余价值。这些剩余价值存在于物联网的每个部分。它充满了网络空间这也是我们在交易过程中的损失。

Confidential Contract

保密合同

SharkMenNetworkaimstobuildaplatformforgeneral-purposeprivacy-preserving.SharkMenNetwork-Completesmartcontracts.Thebasicrequirementsforsuch a platformSharkMenNetwork-Complete smart contracts.The basic requirements for such a platformcould be as follows.

SharkMen 网络旨在构建一个通用隐私保护平台 鲨鱼人网络-完成智能合约。这种平台的基本要求是什么可能如下。

- Confidentiality. Unlike the existing blockchains for smart contracts,SharkMenNetwork avoids the leakage of any input, output, or intermediate state of con-fidential contract. Only authorized queries to the contract will be answered.

• 保密性。与现有的智能合约区块链不同，SharkMen 网络避免了任何输入、输出或 con 中间状态的泄漏-诚信合同。只回答对合同的授权查询。

- Code Integrity. Anyone can verify that an output is produced by a specificsmart contract published on the blockchain.

• 代码完整性。任何人都可以验证输出是由区块链上发布的特定智能合约产生的。

聲明：鑒於地區法律原因本項目不對中國大陸地區開放，項目中採用簡體中文是為了新加坡等東南亞簡體中文應用區觀看

• State Consistency. Anyone can verify that an execution happened at acertain blockchain height, which implies the output of the execution is subjectto a certain chain state.

• 状态一致性。任何人都可以验证执行发生在某个区块链高度，这意味着执行的输出受某个链状态的约束。

• Availability. There must not be a single point of failure such as disconnection of the miner.

• 可利用性不会出现单一故障点，如矿工断开。

• Interoperability. Contracts can interoperate with each other and externalblockchains.The existing TEE solutions, e.g., Intel SGX, can only prevent the leakageof sensitive information during the execution of isolated programs, and provideno guarantee on availability or verification of input data. Thus it requires acarefully-designed infrastructure to integrate TEE into blockchain to meet therequirements above.We are going to introduce the design of SharkMen Network and how it fulfillsthe above requirements in the following sections.SharkMenSharkMe

• 互操作性。合同可以彼此互操作，也可以与外部区块链互操作。现有的 TEE 解决方案，例如 Intel SGX，只能防止在执行隔离程序期间泄漏敏感信息，并且 provideno 可以保证输入数据的可用性或验证。因此，需要精心设计的基础设施将 TEE 集成到区块链中，以满足上述要求。我们将在以下部分介绍 SharkMen 网络的设计以及它如何满足上述要求。SharkMenSharkMe

Abstraction of Confidential Contract

A typical smart contract can be regarded as a state machine of a current state s_n and a state transition function f, which takes input event e_n and last state s_{n-1} to produce the latest state s_n:

保密合同的抽象：典型的智能合约可以被视为当前状态的状态机 sn 和一个状态转换函数 f，它接受输入事件 en 和最后一个状态锡-1 要生成最新的状态序列号；

$$s_n = f(s_{n-1}, e_n)$$

Since the state transition process happens inside the enclave, any ofitsintermediate states remains invisible to outside. We can further encrypt thereached state and input event to prevent the attackers from inferring the internalstate of contract with event replay.

Let csn be the cipher of sn and cen be the cipher of en, the state transitionfunction of a confidential contract p can be represented as:

由于状态转换过程发生在飞地内部，因此任何中间状态对外部都是不可见的。我们可以进一步对获取的状态和输入事件进行加密，以防止攻击者通过事件重播推断合同的内部状态。假设 csn 是 sn 的密码，cen 是 en 的密码，则机密合同 p 的状态传递函数可以表示为：

$$csn = p(csn-1, cen) \quad (1)$$

$$p(csn-1, cen) = Enc\_x0012\_fDec(csn-1), Dec(cen) \quad (2)$$

where Enc and Dec can be carefully-chosen symmetric encryption and decryption functions subject to the contract.

Unlike the existing smart contract, a confidential contract doesn't expose any information outside the enclave by default. To answer authorized queries, we introduce a query function q which takes the current encrypted state csn, query parameters $paras$ and user's identity I (usually a pubkey) as input and returns the response r:

其中 Enc 和 Dec 可根据合同仔细选择对称加密和解密功能。与现有的智能合约不同，机密合约不会公开默认情况下，enclave 之外的任何信息。要回答授权查询，我们引入了一个查询函数 q，它接受当前加密状态 csn，查询参数和用户身份 I（通常是公钥）作为输入和返回响应 r:

$$r = q(cs_n, paras, I)$$

also accept a special query producing side effffects. The side effffects include the egressing data that can be posted back to the blockchain by miners.

保密合同必须首先确认用户的身份，并且然后回答她的问题。除了用户的查询外，合同还可能接受产生副作用的特殊查询。副作用包括矿工可以将逐渐减少的数据发回区块链。

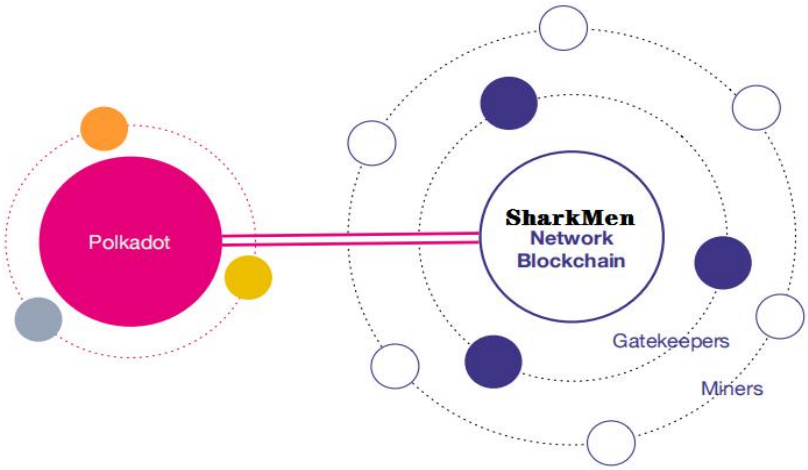

Figure 1: Roles in the protocol.

Node Registration

All the Worker Nodes are required to be registered on the blockchain beforeparticipatinginmining or Gatekeeper election.Remote attestation provides a building block to verify the execution as wellas its output of a certain code inside the enclave. However, running such attestation on each execution is time inefficient. In SharkMen Network we adopt a betterprotocol. The attestation measures the pRuntime instance and the generatedunique identity during theregistration,instead of each execution. In this way,a single attestation is sufficient to ensure the future behavior of the pRuntime.

所有工作节点都需要在之前在区块链上注册

参加采矿或守门人选举。远程认证也提供了一个构建块来验证执行作为其在飞地内的特定代码的输出。但是，在每次执行时运行这样的尝试会降低时间效率。在 SharkMen 网络中，我们采用了更好的协议该证明度量 pRuntime 实例和生成的注册期间的唯一标识，而不是每次执行。这样，一个单一的证明就足以确保该时间段的未来行为。

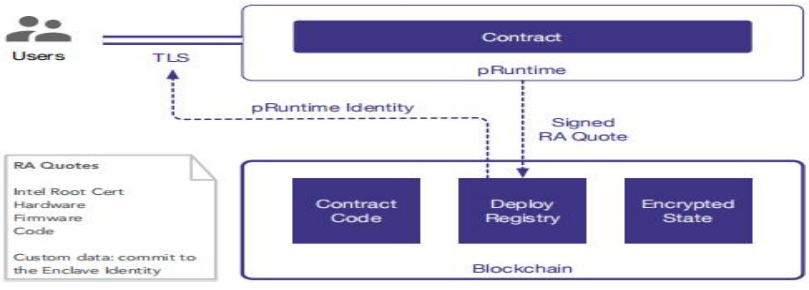

Figure 2: RA and communication.

Business domain

业务域

目录

SharkMen（鲨鱼达人）

一：Stone Age

New Zealand is a country of fishing and fishery production. The prototype of the world's most famous fishing game was developed by Kelvin, a famous software engineer in New Zealand, and was officially launched in 1977. After so many years of evolution, it has changed from a simple mechanical game in those years to a popular and global stand-alone game.

Shark Daren is a deep-sea hunting and exploration game. The game interface is fresh and simple, easy to operate. It is a very simple, flexible and changeable leisure game. This game has been withdrawn and is very popular with players. The game is not only fun for Qin song, but also rich rewards for cotton filling.

With the rise of the concept of meta universe, Kaiwen game R & D team further modified the storage mode and storage progress of the game, making the game adapted from the original simple fishing game into a realistic sandbox experience game with considerable flexibility. Players can not only have a better fishing experience in the game, but also have higher flexibility. So that players can better experience the fun of fishing.

Then sharkmen, who applied trading in the game, was born. Based on the concept of meta universe, sharkmen plays a perfect role in the richness of fishing talent world in the game. This is the rudiment of sharkmen's first stone age.

石器時代

新西蘭是一個捕魚和漁業生產的國家，世界上最為著名的捕魚遊戲的雛形就是由新西蘭著名軟件工程師開爾文開發出來的，于 1977 年正式上市。經歷過了這麼多年的演變已經從當年的一款簡單的機械遊戲變成了現在的風靡與全球的單機遊戲了。

鯊魚達人是一款深海捕獵探險遊戲，遊戲界面清新簡單操作容易，是一款上手度極為簡單，但是又靈活多變的休閒類遊戲。這款遊戲已經退出就十分受到玩家的喜愛。遊戲不僅秦鬆有趣，而且充棉豐富獎勵。

隨著元宇宙的概念興起，開文遊戲研發團隊進一步的修改了遊戲的存儲方式和存儲進度，使得遊戲由原來的簡單的捕魚遊戲改編成一款具有相當靈活度的現實版沙盒體驗遊戲。玩家不僅可以在遊戲中有更好的捕魚體驗，並且能夠擁有更高的使用靈活度。讓玩家能夠更好的體會到捕魚的樂趣。

隨之在遊戲中應用交易的 SharkMen 應運誕生。SharkMen 基於元宇宙概念在遊戲中起到了完善捕魚達人世界豐富性。這就是 SharkMen 的第一階段石器時代的大概雛形。

1.1前期準備

When the production team got this inspiration, it further improved according to this concept, launched its own parallel world in the original fishing game, and perfectly applied this concept to the program, which was improved by the development team. Thus sharkmenteam was officially born

當製作團隊獲得了這個靈感後根據這一概念，進行了進一步的完善，在原有的捕魚遊戲中開展了自己的平行世界，並將這一概念完美的應用到程序中，經由開發團隊進行完善。由此 SharkMenteam 正式誕生

1.2合約配置

After the whole technical team fully understood the concept of metauniverse, it began to officially build sharkmen a year ago.

整個技術團隊對於元宇宙的概念得到充分理解後並與一年前開始正式打造 SharkMen。

二： Black Iron Age

2.1Development prospect

From the perspective of enterprises, metauniverse is still in the primary stage of industry development. There is still a large gap between the underlying technology and application scenarios and the mature form in the future, but it also means that there is a huge space for the expansion of metauniverse related industries. Therefore, if digital technology giants with multiple advantages want to hold the market and start-ups in the field of digital technology want to get the opportunity to overtake in corners, they must layout in advance and even add yards to the universe track.

2.2Project advantages

From the perspective of the whole society, meta universe is not only an important emerging industry, but also a field of social governance that needs attention. Matthew Bauer, a senior research expert on metauniverse, put forward: "metauniverse is a concept at the same level as mobile Internet." by analogy with mobile Internet, we can better understand the internal logic of government departments' attention to it. The government hopes to participate in the formation and development of the meta universe in order to proactively consider and solve the relevant problems brought about by its development.

黑鐵時代

2.1 發展前景

從企業來看，元宇宙仍處于行業發展的初級階段，無論是底層技術還是應用場景，與未來的成熟形態相比仍有較大差距，但這也意味著元宇宙相關產業可拓展的空間巨大。因此，擁有多重優勢的數字科技巨頭想要守住市場，數字科技領域初創企業要獲得彎道超車的機會，就必須提前布局，甚至加碼元宇宙賽道。

2.2項目優勢

從整個社會來看，元宇宙不僅是重要的新興產業，也是需要重視的社會治理領域。元宇宙資深研究專家馬修·鮑爾提出：“元宇宙是一個和移動互聯網同等級別的概念。”以移動互聯網去類比元宇宙，就可以更好地理解政府部門對其關注的內在邏輯。政府希望通過參與元宇宙的形成和發展過程，以便前瞻性考慮和解決其發展所帶來的相關問題。

三： Bronze Age

Long before the outbreak of the meta universe, Mr. Zhai Shanying, based on the development of finance, Internet and business, integrated the wisdom of traditional Chinese culture, insight into the essence of the times, and prospectively put forward the theory of "ecological planet". The "ecological planet" theory holds that the traditional law of human survival and development is about to be completely broken. Another life coexisting with real life, internet life, begins to occupy the dominant position of human development.

Human beings begin to live on the Internet and survive under the Internet, It has evolved into a virtual world in which human spirit lives in the network world - "ecological planet".

早在元宇宙爆發之前，翟山鷹老師就以金融、互聯網、商業領域的發展爲基礎，融合國學智慧，洞察時代本質，前瞻性提出“生態星球”理論。“生態星球”理論認爲：人類傳統的生存和發展規律即將被完全打破，與現實生活並存的另一種生活——互聯網生活，開始越來越多地占據人類發展的主導地位，人類開始在互聯網上生活，在互聯網下生存的意識形態和模式，演變爲人類精神在網絡世界生活的虛擬世界——“生態星球”。In the "ecological planet", smart contracts are widely used to make the network behavior of each node recordable, traceable and measurable, so as to realize digital identity confirmation, behavior consensus, asset ownership and credit sharing. The node's contribution to ecological productivity is accurately recorded, and the principle of distribution according to work in the sharing economy is adopted to match the corresponding business points reward. More contributions and more points form a virtuous circle between points and pay, so as to build a better system with high matching between productivity and production relations and "more work and more pay" to meet the material and spiritual needs of the node.

在“生態星球”中，智能合約廣泛應用，令每個節點的網絡行爲全部可記錄、可追溯、可衡量，從而實現數字身份確認、行爲共識、資産確權和信用共享。節點對生態的生産力貢獻被精准記錄，采用共享經濟按勞分配的法則，匹配對應商業積分獎勵，貢獻多積分多，積分與付出形成良性循環，從而構建起一個更加美好、生産力和生産關系高度匹配、“多勞多得”的體系，滿足節點的物質和精神需求。

四：Silver Age

Perhaps in the future, the world will be extremely scarce in the physical layer, lack of food and drink, no bright sunshine, no green grass, and even endless war. How do people spend this time? The answer is what happens in the next few months. The original universe has entered people's vision. What is the meta universe? That is, human beings create a network world. Human beings can do anything on it. In addition to physical eating, drinking and Lazar, some people will ask, isn't the virtual network world more than ten years ago OK? You're right. It's different. Now the online world created by human society can make money, even support their families, and even become the richest man in the world. The attribute of this work was not found in the online world more than ten years ago. This is the biggest difference between the meta universe and the previous virtual online world.

也許未來世界在物質層會極其匮乏，缺吃少喝，也沒有明媚的陽光，也沒有綠草地，甚至還有無休止的戰爭，那麽這個時候人們需要怎麽度過這段時間？答案就在當下幾個月發生的事情，原宇宙進入了人們的視野，元宇宙是什麽？就是人類創造出來一個網絡世界，人類可以在上面幹任何事情，除了肉體的吃喝拉撒以外，有人會問，那十幾年前的虛擬網絡世界不也可以嗎？你還真問對了，不一樣的，現在人類社會創造出來這個網絡世界可以賺錢，甚至可以養家糊口，甚至于成爲世界首富，而這個工作的屬性十幾年前的網絡世界裏面是沒有的，這就是元宇宙和之前虛擬網絡世界最大的不同。

五：Golden Age

When people move their work to the network, I mean the pure network, people can't leave the space of the meta universe. In 1991, words and links appeared on the first web page, that is, Internet 1.0, Internet 2.0, video, media, interaction or games. Then Internet 3.0 is the online

world on the blockchain. What is the difference between 2.0 and 3.0? In a word, in the 2.0 era, you don't own anything on the Internet except the domain name, but in the 3.0 Internet, you become a part of the Internet and you have your own part.

For example, in 2.0, your video is not yours, but the video platform. He can delete your video at any time, and your fans are not yours, because your account may be deleted, and you have nothing to do with it. But in 3.0, once your video is uploaded to the blockchain and your game props are on the blockchain, any assets of your digital currency will be, You are part of the Internet. This is 3.0.

當人把工作搬到網絡的時候，我說的是純粹的網絡的時候，人們就離不開這個元宇宙的空間了。1991 年的時候第一個網頁出現文字跟鏈接，這就是互聯網 1.0，互聯網 2.0 的時候，視頻、媒體、交互或者遊戲等等，那麼互聯網 3.0 就是區塊鏈上的網絡世界，你問我 2.0 和 3.0 的區別是啥？就一句話，2.0 時代你並不擁有互聯網上任何一個東西，除了域名以外，但 3.0 的互聯網，你成爲了互聯網的一部分，你擁有屬于你的部分。

舉個例子，2.0 的時候，你的視頻不是你的，是視頻平台的，他可以隨時把你的視頻刪掉，你的粉絲也不是你的，因爲你的賬號可能會被刪掉，你一點轍都沒有，但 3.0 的時候你的視頻一旦上傳到區塊鏈上，你的遊戲道具一旦在區塊鏈上，你的數字貨幣任何資產都是的，你就是互聯網的一部分，這就是 3.0。

六：Platinum age

I'll break it up again and tell you about it. When there was a computer, that is, when the computer could communicate with the computer, someone invented a local area network, which was the internal network of the scientific research unit, but it could not be accessed outside the network. There was a local area network in the school dormitory, and the networks of all groups could not be connected, but then there was the Internet, Unified standards have been formulated to make the Internet fly at once, because everyone believes in each other in the Internet communication layer. 0101 can't be anything else. Everyone believes in 0101, but the biggest difference between the metauniverse and the Internet is mutual trust. The technical level of the Internet can achieve unified mutual trust, and the mutual trust between 0101, but in society, There is still no mutual trust between people. We need to rely on a central expert. The expert will tell you that this is a dollar before we believe it.

How can we trust each other in the meta universe? How can we trust each other between two strangers? If there is no central referee, how can we achieve mutual trust between people? Well, this is the core of the blockchain. It seems that millions of computers form an operating system, and no one or organization can modify the data on it. We don't have to worry about being modified by someone. This is mutual trust. In short, the biggest difference between yuanyuzhou and the traditional Internet is the establishment of a mutual trust mechanism, As a result, everyone can work, live and make money in a strange online world, and expand and connect everyone's reputation. Your virtual assets in the meta universe are also valuable to my world. It will not be changed by me, because millions of computers decide together, and it is trustworthy.

我再来掰碎了给大家讲讲，当有了计算机的时候，也就是计算机可以跟计算机互相通讯的时候，有人发明了局域网，就是科研单位自己内部的一个网络，但出了网络外面就访问不到了，学校宿舍有宿舍的局域网，各个群体网络都无法连通，但是后来出现了互联网，制定了统一的标准，才让互联网一下飞起来了，因为大家在互联网通讯层是互相信的，0101 不可能是别的，大家相信 0101，但元宇宙和互联网最大的不同就是互信，互联网的技术层面上可以达到统一的互信，0101 之间的互信，但是到了社会上，人与人之间还是无法达到互信，大家需要依赖一个中心的专家，专家来告诉你这是一块钱，大家才相信这一块钱。

元宇宙里面怎么让大家做到互相信任，两个陌生人之间互相信任，如果没有一个中心的裁判，如何达到人与人之间的互信呢？那么这就是区块链的核心，区块链好像几百万台计算机组成了一个操作系统，没有任何一个人或者组织可以修改，放在上面的数据，大家都不用担心被某个人修改，这就是互信，简单来讲，元宇宙和传统互联网最大的不同是建立了互信机制，导致大家可以在陌生的网络世界里面工作、生活、赚钱，把每个人的信誉扩大、联通。你在元宇宙里面的虚拟资产带到我的世界里面也是一样有价值的，它不会被我改变，因为有几百万台计算机一起决定，它值得信赖。

七：Masonry age

In the long run, the "meta universe" may eventually give birth to a new type of social relationship integrating online and offline. Shenyang, executive director of the new media research center of Tsinghua University, said that on the one hand, the "meta universe" has expanded people's survival dimension, and people will live in a comprehensive environment integrating the real world and the virtual world; On the other hand, it expands people's sensory dimension and brings a comprehensive experience of the combination of real / virtual vision, hearing and touch.

"Looking forward to the future, online and offline will be completely connected, human real life will begin to migrate to the virtual world on a large scale, and human will become a real and digital amphibious species," Shenyang said. At that time, people's lifestyle, production mode and organizational governance mode will be reconstructed.

However, the landing of any emerging technology will be accompanied by unknown risks and challenges. Shenyang believes that with the deepening of the integration of virtual and real, the new crimes in the "meta universe" may pose a great challenge to supervision. Zuckerberg mentioned that no matter social relations or personal items, people will more or less bring some things from the physical world into the virtual world. Therefore, privacy and security issues need to be paid attention to in the "meta universe".

磚石時代

長遠來看，“元宇宙”最終可能催生線上線下一體的新型社會關系。清華大學新媒體研究中心執行主任沈陽表示，“元宇宙”一方面拓展了人的生存維度，人將生活在現實世界和虛擬世界融合的綜合環境；另一方面拓展了人的感官維度，帶來了現實/虛擬視覺、聽覺、觸覺結合的綜合體驗。

“展望未來，線上與線下將徹底打通，人類的現實生活開始大規模向虛擬世界遷移，人類將成爲現實與數字的兩棲物種。”沈陽說。屆時，人們的生活方式、生產模式和組織治理方式等都會被重構。

不過，任何新興技術的落地都會伴隨著未知風險和挑戰。沈陽認爲，隨著虛實融合的深入，“元宇宙”中的新型違法犯罪可能對監管形成巨大挑戰。紮克伯格提到，無論社交關系還

是個人物品，人們或多或少都會從物理世界裏帶入一些事物進入虛擬世界，因此在“元宇宙”中需要注重隱私和安全問題。