Scalable Access Management in Payment Gateway Using Block chain.

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Abstract:- Payment gateway is the e-comerce service that's helps to support the modern retail sales and service over the internet . . Blockchain technology first gained notoriety because of the use of cryptocurrencies, an application which typically only involved the flow of money.We used a new Hilbert curve algorithm called the Block chain[4]. The new architecture is an access control system based on fully distributed block chain technology. An efficient algorithm is provided by Hilbert for space-filling curve generation. The algorithm performs a recursive procedure with simple integer operations and converges quickly on a set of points for the Hilbert curve. The algorithm is elegant, short and much easier to implement than previous recursive and non-recursive algorithms and can be efficiently implemented in all programming languages with integer operations and recursion[4]. The architecture is supported and evaluated in realistic scenarios with proof of implementation of the concept.

Keywords: *Block chain,payment gateway, Hilbert Curve Algorithm.*

I. Introduction

This project is all about the payment gateway using block chain.Using the cloud storage we are implementing this method.A payment gateway is an ecommerce service that processes credit card payments for online. Payment gateways facilitate these transactions by transferring key information between payment portals such as web-enabled mobile devices or websites and the front end processor/bank. In this venture venture we are going to utilize Eclipse structure for execution of our project. The Cloud-based technology refers to on-demand computing and data storage resources located on the Internet, instead of on a business's physical premises. Cloud-based merchant card processing is conducted via payment gateways online point-of-sale (POS) systems linked to merchant accounts. A blockchain is a decentralized, distributed and public digital ledger that is used to record transactions across many computers so that any involved record cannot be altered retroactively, without the alteration of all subsequent blocks. In addition, block chain technology is tamper-resistant and secure. Although block chain technology is developing rapidly, the performance of storing information into a block chain cannot be compared to the performance in a centralized database due to the high latency of block chain nodes confirming transactions For this reason, this work focuses on the performance of networks in order to obtain access control information from the block chain.we propose a new architecture for arbitrating roles and permissions. We used a novel framework named as Block chain with Hilbert curve algorithm.A block chain is a decentralized digital ledger that does not require central management authorities. Although block chain technology is developing rapidly, the performance of storing information into a block chain cannot be compared to the performance in a centralized database due to the high latency of block chain nodes confirming transactions.. In addition, block chain technology is tamper-resistant and secure. Although block chain technology is developing rapidly, the performance of storing information into a block chain cannot be compared to the performance in a centralized database due to the high latency of block chain nodes confirming transactions For this reason, this work focuses on the performance of networks in order to obtain access control information from the block chain.we propose a new architecture for arbitrating roles and permissions. We used a novel framework named as Block chain with Hilbert curve algorithm.

LITERATURE SURVEY:

Xu Wang et al[7]

The Internet of Things using block is ready to transform human life and bring huge economic benefits. However, its adoption is seriously limited by in adequate data security and the confidence of current IoT. Block chain, a distributed and manipulator

resistant leader, maintains consistent data records at various locations and can address data security issues in networks. While providing data security, Block chain also faces a number of critical challenges, such as a large number of devices, non-homogeneous network structure, limited computing power, low communication bandwidth and error-prone radio connections. This paper presents a comprehensive survey of existing Block chain technologies focusing on applications. [4]Block chain technologies that can potentially address the critical challenges arising from and therefore suit applications are identified with potential adaptations and improvements based on consensus protocols and data structures of the Block chain. For the effective integration of Block chain into networks, future research directions are collated.

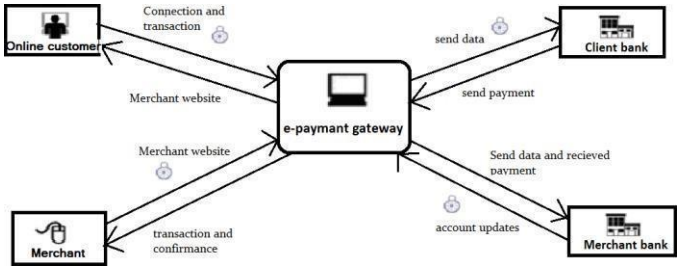
George Dorasatos et al[8]: chain is a distributed, unchangeable ledger technology that supports crypto currencies. At present, block chain solutions are being proposed to address various problems in various areas. This paper presents a review of the scope of scientific literature to map the current research area of biomedical block chain applications[4]. The objective is to identify biomedical problems with block chain technology, the level of maturity of the respective approaches, the types of biomedical data considered, the features and functions of the block chain and the technological frameworks used in the block chain technology. The study follows the methodology of PRISMA- ScR. Literature search was carried out on August 2018 and 47 research articles were identified for detailed study in the systematic selection process. Our findings show that the field is still in its infancy, with most studies in the phase of conceptual or architectural design; only one study reports demonstration and evaluation in the real world. Research focuses heavily on the integration, integrity and control of access to health records and patient data. Other diverse and interesting applications for medical research, clinical trials, the supply chain of medicines and medical insurance are emerging, however.

Thomos Buocz et al[9]:

Block chain technologies benefit from significant social and business interests. Crypto currencies such as Bit coin have grown rapidly over the past 8 years in user adoption. Block chain technologies, however, which fuel crypto currencies, can be extended even more deeply to other business applications. Block chain can be used to drive innovation and increase efficiencies in new fields -including digital arts management, supply chains and healthcare -but technical, organizational and regulatory headwinds remain to be overcome before mass adoption can take place. We provide a short history of block chain in this article and identify some of the key features that have enabled its popular use in the crypto currencies world. We discuss how block chain technologies have evolved from traditional software and web technology, then examine their underlying strengths and evaluate new cases of use without cryptocurrency. We conclude by looking at block chain limitations and present several important factors for managers considering the implementation of block chain in their organizations.

EXISTING SYSTEM:

We use an electronic gateway in the existing system that is used for secure transactions between customer and trader. If the new user wants to do a transaction, he / she should register first via the registration form and then browse the merchant's website using the e-payment gateway. Select item, encrypt and send it to the server. The server receives encrypted messages from the sender, decrypts, reads, encrypts them using its own keys and sends them to the client bank. The customer bank transfers the required amount through a secure network to the merchant bank. Merchant bank sends the payment after receiving the fund. Customer Interface, Server Interface, Client Bank Interface, Merchant Bank Interface, Merchant Interface, Merchant Interface. Online customers connect via the Internet to the e-payment gateway. The gateway connects to the bank and checks if its bank accounts are sufficient to purchase the required product. Online customers can also visit the website of Merchant via the gateway. Secure Pay provides a payment gateway that allows traders to accept credit cards and electronic checks as payment methods for goods and services sold online. The gateway serves as a bridge between the website of the merchant and the financial institutions involved in the processing of payments. Payment data is collected from the shopper online and submitted for real-time approval to the gateway. The payment gateway, however, is aimed at traders who process Card-Not-Present transactions. In a non-present card We proposed an electronic payment gateway model based on the requirements of an electronic payment gateway in developing countries, the merchant and the buyer are not in the same physical location and the customer usually calls the payment data or keys to the credit card details on the website. All e-commerce and e-commerce orders are Card-Not-Present.



We have many security problems in this system. An intellectual technical person may hack the bank details while transferring messages to the central system or even the central system to the merchant between the customer or the customer. They can change the amount, they can have full access to our bank account for a few seconds, we can see that during the generation of otp, we don't press the home button on your phone, so all these abusses will happen at this time.

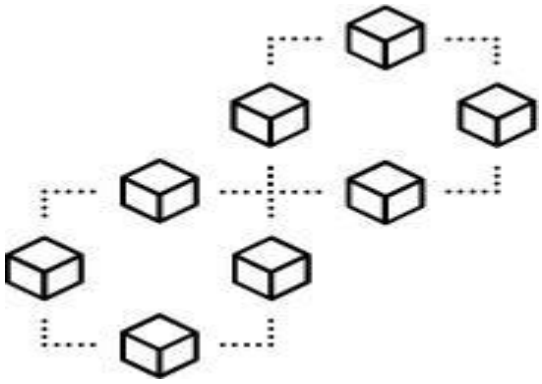
It is because it uses the source memory address of the node until it reaches the destination when it is transferred to the merchant or central system, so that if another person knows this address, all credential and privacy details can be changed. In our country, the electronic payment gateway is present, but it is not very secure. The security factor was also lacking in the existing payment architecture. Most people because of security don't trust online shopping or online transactions. Security is the main problem behind Gateway design. As if only authentic customers can now purchase products from the website of the merchant whose bank accounts are sufficient to purchase the required product. At first it is checked whether the customer is authorized or not, then the entire transaction is carried out. The electronic payment gateway is sufficiently secure that any authorized customer can rely on it easily and make payments over the Internet fearlessly or confidently.If this system is to be implemented in developing countries, strong support from that country's government is needed, since there is little awareness of electronic transactions in developing countries. The planned payment design lacked the protection problem together. This planned design is securely created by the implementation of safe action strategies for the electronic group. The electronic payment entry is created secure enough that any licensed customer simply trusts it and creates payments over the net intrepidly or confidently.

PROPOSED SYSTEM:

To arbitrate roles and permissions in IoT in the proposed work, we propose a new architecture. We used a new framework called the Block chain with the Hilbert curve algorithm. The new architecture is a fully distributed IoT access control system based on block chain technology. An efficient algorithm is provided by Hilbert for the generation of space-filling curves. The algorithm implements a recursive procedure involving simple integer operations and quickly converges to the Hilbert curve set. The algorithm is elegant, short and significantly easier to implement than previous recursive and non-recursive algorithms and can be implemented efficiently with integer operations and repetition in all programming languages. The architecture is supported by evidence of the concept's implementation and assessed in realistic IoT scenarios**.**

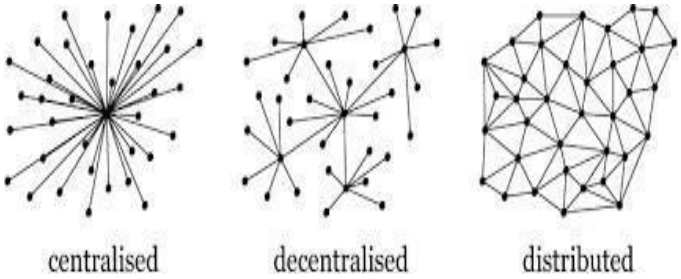
Block Chain

We first provide an overview of the block chain technology, which later serves to understand in more detail the advantages of this technology for our system. Block chain has thus been applied to areas other than crypto currencies, since its potential exceeds Bit coin. On the other hand, it is an ideal component for IoT solutions with its strengths. It is designed to prevent central authorities from dictating the system's rules, its stored information is fully auditable and public to all peers, the transactions are validated by all peers ' consensus, and the technology is tamper-proof and can not be manipulated by malicious actors. A transaction is an exchange of information that is transmitted to the network between different entities. Transactions are stored in chronologically ordered blocks and each block contains a hash of the previous block that creates a block chain. The chain's first block, called the genesis block, is the only block that does not contain the previous block's hash. This block is hardcoded almost always in the software.



Overview of decentralized managemenet:

We have previously developed an architecture for the arbitration of roles and authorisations in IoT. The architecture has been created according to the following principles: Mobility. IoT devices can move freely between different administrative domains and are still managed by the policies for access control stored in the block chain[4]. The weight is light. Due to their limited capabilities, the IoT devices themselves adopt our solution without any change. It can be scaled. Our solution's decentralized form facilitates the management of many IoT devices.



User Module

The user interface design in this module is designed to add user details. The user interface design to add bank details is also developed. The admin has the right to add the user's bank details. The admin has a default login username and password and gives the user access to the bank.

Manager Module

A manager is an entity responsible for the management of a set of devices ' access control permissions. Managers do not belong to WSNs and in most cases are device owners. Their role is to interact on behalf of the devices with the blockchain network, as devices can not interact on their own with the intelligent contract. The manager can define specific access control permissions for them after registering the devices under the control of the manager. In addition, all devices registered in the system must belong to a specific registered manager.

Agent Node

The Agent Node is a specific blockchain node responsible for the implementation of the intelligent contract. Once the intelligent contract is successfully deployed in the blockchain network, the Agent Node shares the address of the intelligent contract with other architectural entities. A smart contract contains two types of operations. The operations triggered by blockchain transactions and blockchain operations[4]. The former must be validated by the miners and therefore stored in the blockchain, while the latter does not. In addition, no fee or significant delay is incurred. The restricted device information, manager information and access control policy details are stored in two different data structures in the smart contract. In addition, managers are the only entities capable of interacting with the smart contract through transactions to register, de-register and define new policies in the system. Management hubs can, however, only query blockchain permissions using the call method.

Transactions through BlockChain

The blockchain is a digital directory of previous transactions. A transaction is an exchange of information that is transmitted to the network between different entities. Transactions are stored in chronologically ordered blocks and each block contains a hash of the previous block that creates a block chain[4]. The chain's first block, called the genesis block, is the only block that does not contain the previous block's hash. This block is hardcoded almost always in the software.

Access Management Technologies in IoT

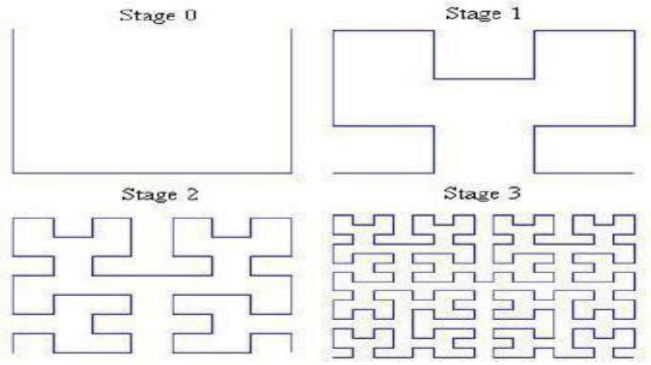
There are mainly two standard approaches to IoT access management. The Internet Engineering Task Force (IETF) develops the first approach and is known as the CoAP Management Interface (CoMI)[5]. The other approach is called LWM2 M[5] developed by the Open Mobile Alliance (OMA). Bootstrapping allows the LwM2 M Bootstrap Server to manage the device's access control and configuration to register it on a LwM2 M server.

Blockchain Network

Ethereum[4] was the blockchain technology chosen for our implementation of proof-of-concept. Ethereum is a program-matic platform that includes a complete Turing scripting language called Solidity8, which is used to implement intelligent contracts. The miners in the network help to keep the network safe and stable by approving transactions and storing copies of the blockchain. The information is completely decentralized and proof of manipulation.

HILBERT CURVE ALGORITHM(space filling):

The closest neighboring dependency of Markov chains has been looked at, we need to look at a method that looks at every pixel in an image quickly and efficiently. The challenge is to scan the image with a continuous curve that is as "crimped "as possible through every pixel on the pixel grid. It is also true that we do not want our algorithm to intersect over itself, so that it runs more efficiently. The curve scans an array of pixels of 2 m x 2 m. A curve of Hilbert is a continuous space curve They are also fractal and self-similar; if you zoom in and look closely at a section of a higher-order curve, the pattern you see looks exactly the same as itself. An easy way to imagine the creation of a Hilbert Curve is to imagine that you have a long string and that you want to put it on a grid of squares. Your objective is to drape the string over the board so that the string only passes once through each square of the board.



Sub-Optimality of the Hilbert curve:

In contrast, we show that the Hilbert curve can have an approximation ratio for cubic queries in two dimensions, and for cubic queries in three dimensions, an approximation ratio of 2 3. The approximation ratio of the Hilbert curve can therefore be unlimited, even in the case of two-dimensional cube queries

$$h(t) = \sum_{j=1}^{\infty} \frac{(-1)^{e_{0j}}}{2^j} \text{sign}(q_j) \begin{pmatrix} (1-d_j)q_j - 1 \\ 1 - d_j q_j \end{pmatrix},$$

Clustering number of the hilbert :

In contrast, we show that the Hilbert curve can have a ratio of approximation for two-dimensional cubic queries and a ratio of approximation 2 3 for three-dimensional cubic queries. Therefore, even in the case of two-dimensional cube queries, the approximation ratio of the Hilbert curve can be unlimited: For cube queries, we show a sharp gap between the clustering numbers of the Hilbert curve and the onion curve. This provides a concrete example of this. Although only one query is displayed, the result is similar when we take into account a query set formed by all possible translations of this query form. Let H n be a d-dimensional curve of Hilbert filling the universe of U on the side n. Consider the query set Q formed by all possible translations of a d-dimensional cube query q of side', where'= n−O (1). The average clustering number of H d n for Q is c (Q, H d n)== n d- 1 d for d= 2, 3. In order to take into account the stopping words, we will also add a weight of the Inverse Document Frequency (IDF)

Conclusion and future study*:*

This paper presents a proof-of-concept architecture that uses blockchain technology to implement an access man-agement system payment , where credentials and permissions to access the1. various resources are stored globally in the blockchain. One of the main differences of our solution with regard to the existing ones is its decentralized design, where the policy of the whole system is stored in a blockchain . This helps the member to get the best answer for their question .Even though the answers are considered to be best they may not be accurate and all the measurments and view is based on our perspective ,there will be a possiblitty of human errors, machine errors so it becomes a vital limitation of the research paper thus in our future studies we may use artificial intelligence algorithms where the system answers the questions without human intervention.

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