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Resource Tokenization for Crowdfunding of Wireless Networks

Jagadeesh B N, Bikram Prasad Joshi, Anuj Gupta, Birendra Kumar Baniya, Harendra Prasad

Assistant Professor, Dept. of CSE, East West Institute of Technology, VTU, Bangalore, India

UG Student, Dept. of CSE, East West Institute of Technology, VTU, Bangalore, India

UG Student, Dept. of CSE, East West Institute of Technology, VTU, Bangalore, India

UG Student, Dept. of CSE, East West Institute of Technology, VTU, Bangalore, India

UG Student, Dept. of CSE, East West Institute of Technology, VTU, Bangalore, India

ABSTRACT: Crowdfunding is the process of financing a project or business enterprise by soliciting small contributions from a large number of people, usually online.Crowd financing is a kind of online fund-raising that was first developed as a way for members of the public to contribute modest sums of money to support the initiatives of creative individuals. Through crowdfunding, individuals may finance fledgling businesses with the help of a middleman, such a broker-dealer. Because they don't offer the Donor Guarantee Policy and they don't have control over the money they gave, the present sites are problematic. This essay suggests leveraging blockchain technology for crowdfunding. This allows us to offer crowdfunding in a secure, transparent, and safe manner. In order to make it simple for campaign creators and contributors to start and support campaigns, this paper provides interactive forms for campaign creation, donation, and request approval.

KEYWORDS: Blockchain, crowd funding, resource tokenization

I. INTRODUCTION

World are about to roll out 5G wireless networks in the telecommunications sector. New wireless standards offer improved Spectral Efficiency (SE) increases, and the 5G/NR standard also claims to give higher SE compared to 4G/LTE.This paper's primary goal is to disseminate study findings on crowdsourcing sites that use blockchain technology. A blockchain-based automatic network tokenization mechanism is suggested for that aim.

A quick and simple approach to get money for original project ideas is through crowdfunding. The issue is that the present crowdfunding businesses charge large fees and occasionally commit frauds. To prevent issues of this nature, a blockchain-based crowdfunding strategy should be used. The usual transaction costs and platform fees often associated with other crowdfunding sites, including Kickstarter, are eliminated by using Peer to Peer smart contracts. Our project's goal is to develop a dependable application that will give life to every fresh concept. We have created a crowdfunding platform that runs on the blockchain. For everyone to produce and submit their ideas on our programme, we offer a simple user interface. The public then has access to these concepts. Anyone who wants to help them in their beliefs is welcome to do so. These procedures are all carried out collaboratively.

The public may find it tempting to invest in the infrastructure of wireless communication systems. However, it is important to identify and segment wireless network resources into investable parts. Tokenization is a crucial initial step in breaking down the infrastructure of a wireless network into investable parts. How to tokenize wireless resources in a way that delivers funding for network investment and revenue to investors with the least amount of risk is an ongoing research subject.

II. LITERATURE REVIEW

A. Wireless Network Architecture

The 5G network architecture and network interfaces are displayed in Fig. 1 [1]. An N2 interface connects a base station to a 5G core network, and this interface carries all control data to the core network from the base station. User

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information is sent over the N3 and N6 interfaces. A backhaul link is required to connect to the core network when a base station is placed at a specific location [1].

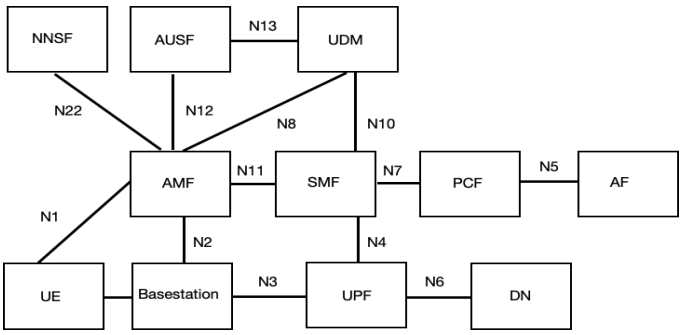

Fig 1: 5G network architecture and network interfaces

Any kind of wired or wireless connection can be used as a backhaul link.

B. Blockchain

Authors used an optimization function which considers nature of the packet, size of the packet and distance between the nodes, number of hops and transmission time are also considered for optimization. In [4] initial population for Genetic Algorithm has been computed from the multicast group which has a set of paths from source to destination and the calculated lifetime of each path. Lifetime of the path is used as a fitness function. Fitness function will select the highest chromosomes which is having highest lifetime. Cross over and mutation operators are used to enhance the selection. In [5] authors improved AODV protocol by implementing a balanced energy consumption idea into route discovery process. RREQ message will be forwarded when the nodes have sufficient amount of energy to transmit the message otherwise message will be dropped. This condition will be checked with threshold value which is dynamically changing. It allows a node with over used battery to refuse to route the traffic in order to prolong the network life. In [6] Authors had modified the route table of AODV adding power factor field. Only active nodes can take part in rout selection and remaining nodes can be idle. The lifetime of a node is calculated and transmitted along with Hello packets. In [7] authors considered the individual battery power of the node and number of hops, as the large number of hops will help in reducing the range of the transmission power. Route discovery has been done in the same way as being done in on-demand routing algorithms. After packet has been reached to the destination, destination will wait for time δt and collects all the packets. After time δt it calls the optimization function to select the path and send RREP. Optimization function uses the individual node's battery energy; if node is having low energy level then optimization function will not use that node.

II. PROPOSED ALGORITHM

The formula for the price of VUPU is

$$P(T)_{\text{VUPU}} = \frac{\sum_{n=1}^{B}\left(DDF_n \cdot SUF_n \cdot \left(\sum_{i=180k}^{T=180(k+1)}\left(RPU_{i,n} \cdot N_n\right)\right)\right)}{S^{\left(\frac{1}{DDF \cdot SUF}\right)}} + \frac{\max\{TI,0\}}{S^{\left(\frac{1}{DDF \cdot SUF}\right)}}. \quad (10)$$

A cluster will initially issue 1000 shares, and the timing of the issuance will be determined by network performance. Shares will undoubtedly be issued whenThey are the most valuable at that time, and investors will sell shares at that time as well.The effect of DDF on a cluster's distributed share count. When DDF rises, the price of the issued share will rise together with the value of the network cluster. The share price will climb more quickly and stabilise later (DDF = 2,

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3) if the wireless network first handles a broad range of traffic.The price will likewise rise with more traffic supplied by the network, albeit with a smaller step-size (DDF = 4). The demand of investors for the price of shares is not examined in this article; it will be in the one that follows.There is a cluster head for each network cluster. When VUPUs are created for a network cluster, they are recoded in small-cell blockchain either as a new block or as a portion of an already existing block. Each miner base station in a network cluster, each of which has a variable number of miners, produces a block.

Each network base station's load is verified using a consensus mechanism.The Bitcoin networkuses proof of work, whereas the Ethereum network uses proof of stake.

For the network depicted in Fig 2, a total of 6 messages are sent and received between base stations. According to

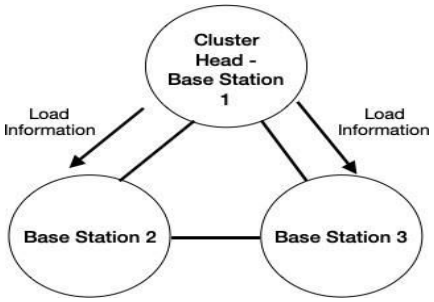

Fig. 12, there are 2. N + N. Messages between nodes are exchanged in the form of (N-1) = N. (N+1) messages, where N is the total number of base stations excluding the cluster head. In this logical network topology, two base stations are

Fig.2–Clusterhead,basestations,andmessaging

controlled by one cluster head. The block generation rate is extremely important since each VUPU transaction is stored in a block. And when each base station in the network cluster has cast a vote, the block is generated.

'Load verification' messages are what each base station delivers to the network cluster as part of the voting process. Each base station in the cluster delivers its load verification votes to the network cluster head, which is conducting the consensus procedure. Load verification is the process of having another base station confirm the load of a base station in the network so that correct load data may be gathered for better pricing of network resources. When one base station verifies another base station's load, the verifier base station sends the cluster head a "Yes" vote; otherwise, the verifier base station sends the cluster head a "No" vote. If there are more "Yes" votes than "No," a new block is made and used to record all network transactions involving VUPUs.

$$BCR = (C\,.\,M.DTL) + (BP(\,1\,TDF)\,)$$

where BPS is the processing speed of the base station, DTL is the delay in data transmission, M is the number of nodes other than the cluster head, BCR is the block formation rate, C is the constant, and M is the number of nodes.

III. Conclusion and Future Work

. The use of blockchain in crowdfunding is a relatively recent idea. We took that into account while designing our software, making it simple enough for the average person to use. But it's not the end yet. Our application has a promising future and lots of room for growth and evolution as a result of the development of Blockchain and the introduction of ICOs. Since the world is still adjusting to blockchain technology and cryptocurrencies, it will take a few more years before Ethereum-based Dapps gain widespread acceptance and are acknowledged by the community. In this context, a blockchain-based crowdfunding tool is a difficult notion for everyone to grasp. We took that into account while designing our software, making it simple enough for the average person to use. But it's not the end yet. Our application has a promising future and lots of room for growth and evolution as a result of the development of Blockchain and the introduction of ICOs. We hope to make the process of bringing these ideas to life through our crowdfunding application even simpler and safer in the future

IV. Acknowledgement

In this paper, we present a comprehensive review of crowdfunding and to secure the transaction details. Based on our review of the literature, we identified a need of a security enhanced system for crowdfunding. To address this gap,

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we propose a system that uses blockchain technology using ethercoin. We anticipate that this research will lead to the development of a cost effective and efficient solution to prevent from scam and builds a trust in both donor and creator.

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