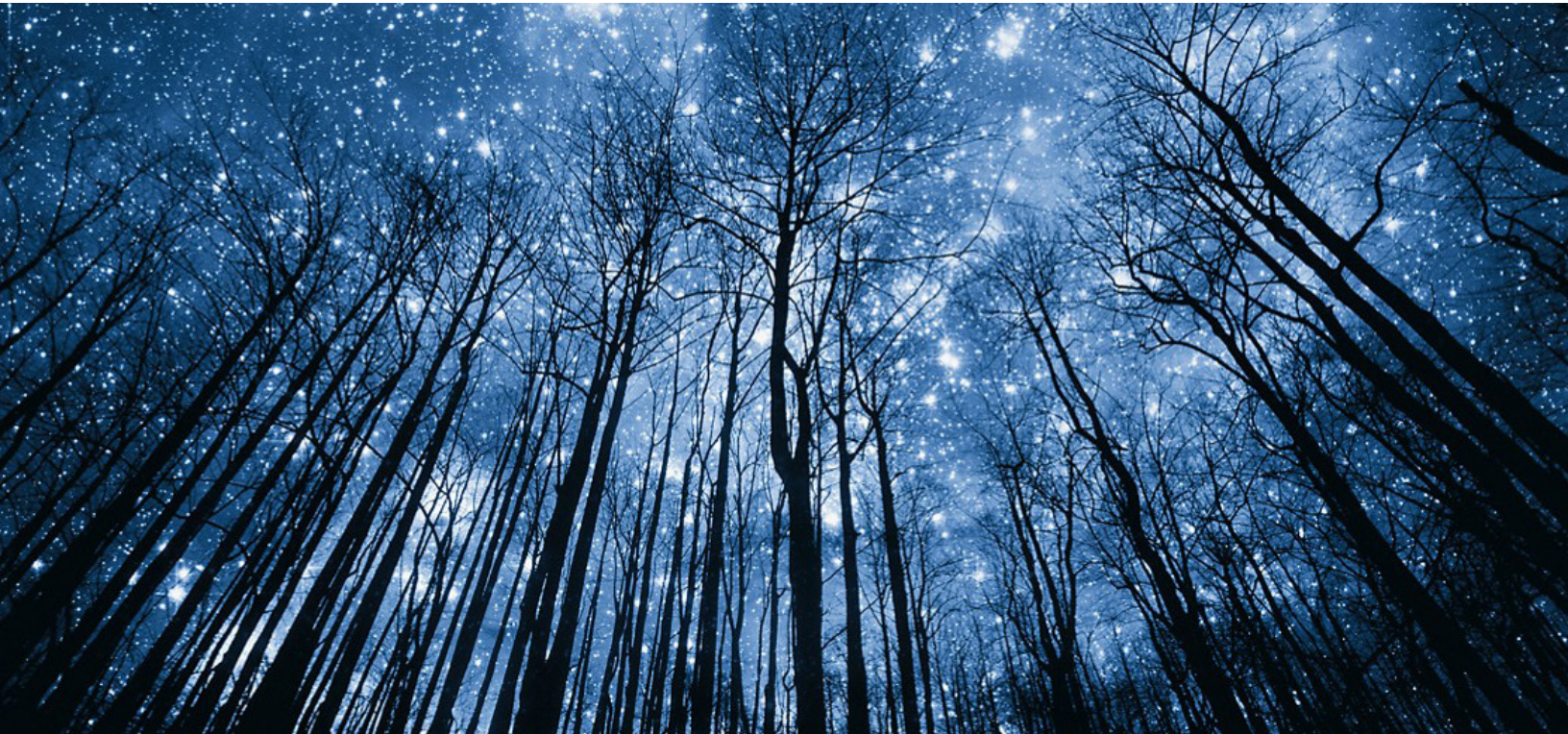# DELL Technologies

DECENTRALIZED APPLICATION (DAPP) ON BLOCKCHAIN
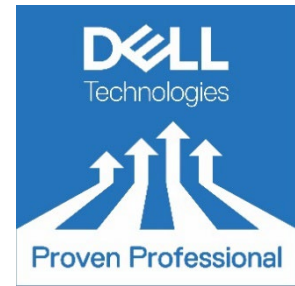
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ABSTRACT

This article talks about a new category of applications being talked about across the world - Decentralized Application (dApp).

These are applications that do not have an owner, cannot be closed, and cannot have a rest period or downtime. Such new class of applications is named dApps (Decentralized Applications).
A dApp is an open-source software platform applied on decentralized blockchains and is powered using tokens that are created using a protocol/algorithm.

A centralized application is handled by a single organization. The application software for a centralized app dwells on one or more servers controlled by this organization. A user must interact with the app by downloading a copy of it and sending and receiving the data from the organization's server.
Nonetheless, before we discuss dApps, we need to know about 'Blockchain' - the technology on which dApps are banked upon.

Bitcoin was the original cryptocurrency, that presented Blockchain technology to the world. Bitcoin's blockchain is a worldwide circulated ledger that records transactions and is protected cryptographically through a robust agreement process.

A decentralized app (dApp) functions on a blockchain or peer-to-peer network of computers. It allows users to get involved in transactions directly with one another in contrast to depending on a central authority. The user of a dApp would make the payment to the developer with a quantity of cryptocurrency to download and utilize the program's source code or also called a smart contract, that permits users to complete transactions without disclosing personal information.
The dApps are created on the basis of blockchain technology that has unlocked the opportunity of a newer and more thrilling world. And this new world is about making the whole thing as decentralized as Bitcoin's blockchain did for currency.

Based on which blockchain model these dApps use, they are classified into three types: Type1 that has its own blockchain (like Bitcoin), Type 2 that uses the blockchain of Type I dApp (like Omni Protocol), and Type3 that uses the protocol of a Type II dApp (like SAFE).

There would be several benefits with decentralized apps. Users do not have to submit their personal information for usage of the app providing the specific function. dApps use "smart contracts" to complete the transaction amongst two unnamed parties without the requirement to depend on a central authority.

Likewise, a decentralized social media platform would be resilient to censorship because no sole member on the blockchain could block messages from being posted or even delete them. Ethereum could be considered a resilient platform for creating new dApps that provide the infrastructure required by developers to focus their efforts on discovering ground-breaking usages for digital applications. This could empower the quick positioning of dApps in diverse industries including banking and finance, gaming, social media, and online shopping.

Over the years, the dApps have advanced significantly owing to the modernization, and creativity of the developers. Consequently, we can see many new evolving dApp instances custom-made for a variety of enterprises in varying sectors.

Lastly, the paper will conclude why the traction towards dApps is snowballing gradually as people and enterprises identify their real functionalities. To quote "Johnston's Law" - Everything that can be decentralized will be decentralized.
So, a decentralized future awaits us.

INTRODUCTION

With the introduction of blockchain, many people are wondering, why pay an average person like any other food delivery service requests when you can use an app that connects you directly to restaurants and is neutral? That is the promise offered by dApp, or internationally decentralized apps.

Basically, dApps or internationally distributed applications are applications that are built on distributed platforms that are widely distributed among their users and that are fully open source. This means that they are designed to avoid one point failure and are more transparent and accountable than existing applications. And moreover, because traditional applications run on a single computer network, and DApp runs on a peer-to-peer network, where no single organization has full control, it will do its job even if one node is online on the network as shown in the picture below.
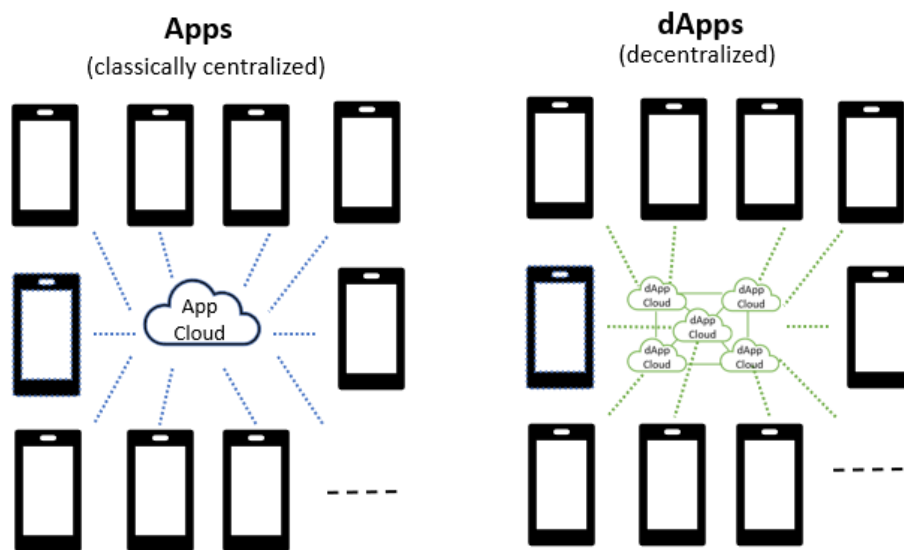

Figure 1: Apps versus dApps topology

The question is, does it have an effect? Most of us who use apps daily can acknowledge that many of our digital assets are not really ours and are fully controlled by application owners. For instance, the documents we upload to websites can be easily downloaded or hosted by the web host, and we have no control over how our data is used by these applications.

With distribution platforms, the main components of the application are used on a distributed network that is publicly accessible and viewed by anyone. Here, users use secret keys that provide the ownership of digital assets and tokens in the network, which also allows users to have full control over these assets. dApp developers leverage the open-source model to create competitive products that connect to this distributed network, enabling users to choose and control how they interact with these applications. In essence, dApps restores power to users.

KEY FEATURES OF A DECENTRALIZED APPLICATION

- They run on the blockchain
- They are open source and work automatically without any person or group controlling most of the tokens
- They generate DAPP tokens to provide value to their users /nodes
- Users are given access to them by exchanging tokens
- Miners are awarded tokens for their successful contribution to the ecosystem

INSTANCE OF A DAPP

An old example of dApp is Bitcoin. It has increased the flow of money transfer problems and allows you to transfer types of money without the need for an official to verify the validity of the transaction. It is this feature itself that allows us to be called dApp. And another similar example is Ethereum. Now, there are over 2,000 dApps available on the market right now and the industry is growing at a rapid pace. You can even see the world divided into dApps through platforms like Trurwallet and DApp Pocket.

TYPES OF DAPPS

Decentralized applications can be categorized into three types:

Type 1: Bitcoin is an example of Type 1 dApp because it has its own blockchain and other cryptocurrencies with their own blockchain that fall under this category.

Type 2: This type of extended application uses a blockchain type 1 application. These internationally distributed apps are contractual and contain the tokens needed to operate. The Omni Protocol is an excellent example of type 2 applications. Omni is a distributed trading platform developed over the Bitcoin blockchain as a 'platform' to facilitate the exchange of 'assets or effortless' assets or value between organizations without the involvement of intermediaries.

Type 3: Type 3 DApps uses the protocol for type 2 applications. The Secure Network (where SAFE stands for Safe Access for All) is an example of Type 3 DApp. It is a shared data system and a communication network that replaces data centers and servers with additional computer resources for its users. You can also view it as a standalone data network that allows for the creation of web-based websites and applications. It uses the Omni Protocol to uninstall SafeCoins and use them to enable its own operating features.

Decentralized Apps vs Traditional Apps (Advantages)

• As they are not centralized, these applications are not compromised, and the records here cannot be changed. Also, be aware that they are very secure and do not interfere with hacking, intrusion, or any other destructive potential.

• Allows processing of instant payments due to the absence of intermediate applications such as an integrated payment gateway

• Encourages greater anonymity as these apps do not require users to follow longer registration processes

• Provides reliable data records because users can access the public blockchain to verify transaction details
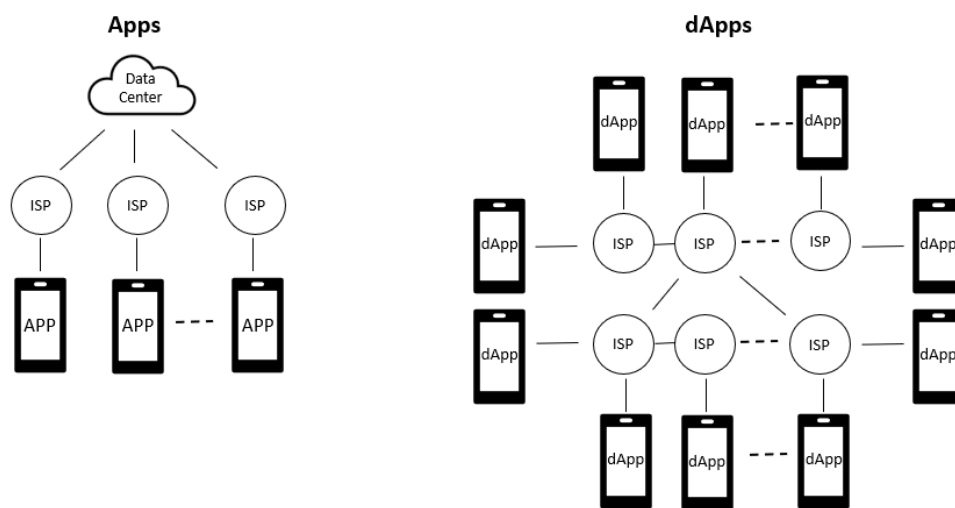

Figure 2: Traditional Apps versus dApps network

DISADVANTAGES OF DAPPS

Since everything sounds great, then why does not everyone goes with apps that are decentralized? The reason is because there are a lot of inaccuracies.

Now the worst thing about divided applications is the cost. It just costs a lot of money with a lot of cryptocurrencies to be able to use a country-divided app. Not only do you need to upload a smart contract to the blockchain costing and transaction fees, but you also need to use a smart contract, call a smart contract, which costs transaction costs.

And then if you want to keep any information on the blockchain, that will cost you money. And it is just too expensive, too much. Even keeping exceedingly insignificant amounts of data on a blockchain can cost you hundreds, if not thousands of dollars. And we will do, it does not make sense for many companies or applications to use this because of the exceedingly prohibitive cost. Now, some of the main disadvantages of location-divided applications include high latency. It can take a long time to process what is being

loaded with smart new contracts, bad user information, inability to manage the secret key and passwords and all the other data you need right now. It is not just a great self-awareness engineer.

Solutions – Layer 1 and Layer 2

There are several types of solutions that can be implemented to mitigate the disadvantages and make them more cost efficient and to make them have many lower latencies. Now, those solutions are categorized into layer, one solution and layer two solutions. Now layer one solution uses the underlying blockchain technology. So, a layer one solution would be just using a theory or using Bitcoin using the actual cryptocurrency or blockchain itself. Now one solution within the layer, one solution is something called sharding.

Now what sharding is, is splitting up all the code or all the aspects of a decentralized application into things called shards, and then distributing that on the blockchain network, such that it gets executed faster and you do not need to wait for say an entire massive, large piece of code to be executed. Instead, you have, you know, 20 or 30 pieces of code that are being executed or 20 or 30 shards that need to be, you know, run through the network. And so, you can kind of split this up and things can go a lot faster, just like what would happen if you said, split your application into multiple threads or multiple cores. So that is one solution layer, one solution called sharding that can increase the speed and cost effectiveness of using blockchain.

However, then you have layer two solutions. Now layer two solutions are typically more advanced and what they are is a technology or system that lies above the underlying blockchain technology. So, an example of a layer two solution would be something like state channel. Now a state channel is a way that two users can communicate without using the blockchain in the way in which the blockchain would work a little bit confusing, but it is like using the blockchain, just not using the blockchain, such that you do not have to pay the huge latency and cost associated with the blockchain.

So, what happens is two users will communicate with each other using the state channel, and then once the communication is done or the transaction is complete only then will it be uploaded to the blockchain? So rather than say, having a thousand micro transactions occurring on the blockchain, you have those occur in the state channel. And then those get wrapped in one larger transaction, which then gets uploaded onto the blockchain. Again, the purpose of that is to lower the latency and to make sure that you are not going to have to pay massive fees for all the different transactions that are going through.

FUTURE OF DAPPS

dApps will continue to grow significantly in the future. Customized apps will be more involved in everyday life, reducing costs and removing external companies from many of our personal and business features. These applications are expected to take automation security and performance to the next level.

dApps defended its position as a valuable tool and paved the way for development and improvement. In the future, dApps is expected to become the talk of the town as more investors jump to benefit from the efficiency of these platforms.

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