Directed Acyclic Graphs (DAGs)

Understanding DAG

The Directed Acyclic Graph (DAG) is a DLT variation that has been presented as a Blockchain alternative.

Due to their arrangement in a directed graph, the cooperating nodes of a DAG are capable of cross verification.

The use of DAG improves the network's scalability and lowers transaction fees by allowing fee-free nano-transactions

DAG does not require miners or the underlying energy-intensive infrastructure since it achieves consensus without implementing the classic hash-protected PoW.

Significant Features of DAG

Scalability: DAG is well-known for its nearly limitless scalability. In contrast to previously distributed ledgers, DAG improves scalability as the network grows

Compatibility: By implementing transaction fee-free strategies, DAG, as a decentralized channel, allows participants to make fast micro or even nano-transactions.

Resilient: Using the Winternitz one-time signature mechanism, DAG makes the underlying distributed ledger less susceptible to quantum computers with higher-level computing characteristics.

Validation: DAG's quantum resistance allows for masked authenticated messaging and parallelly lined transactions, which is a great way to transform data using encryption and authentication techniques.

DAG-Based Blockchain

DAG-based blockchain has been proposed as the next generation of Blockchain.

It inherits the key features of both DAG and Blockchain.

The distributed ledger encapsulates transactions in blocks using a DAG structure. It uses a verification mechanism in which every new transaction must be validated by at least two previous transactions before being added to the Blockchain.

Individual transactions in a DAG give validation for each other. Users on the network can both mine and validate transactions, but they cannot validate their own. This usually signifies that there is little or no need to pay fees in a DAG.

Advantages and Disadvantages of DAG

Advantages:

DAGs are highly suited to enormous numbers of transactions, including micro and nano-transactions, because they scale very effectively and prevent or reduce user fees.

DAGs also eliminate the need for miners and, as a result, mining equipment, resulting in reduced energy consumption.

Disadvantages:

As the number of Blockchain transactions grows, so does the amount of storage and network bandwidth required.

DAG projects have so far included centralized features such as central co-ordinators, pre-selected validators or 'witness' nodes, or completely private network systems. They are unable to sustain 'pure decentralization' till date.