SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

COURSE NAME: 19OE201-Blockchain Technology

IV YEAR /VII SEMESTER

Unit 4- HYPERLEDGER

Topic- Consensus

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Hyperledger Consensus

- The term "consensus" means an agreement or a decision taken by a group of individuals.

- It also states that regarding a certain topic or problem, all the members of a team or group have concluded that everyone will accept the certain way or method using which they will solve the problem.

- Consensus is taken into account in certain situations where to solve a particular problem or reach a goal or something, an entire group or team is involved, and there are at least two different opinions on how to solve the problem or reach the goal.

- Blockchain Technology depends heavily on consensus mechanisms.

Different Types of Consensus

Consensus Name	Brief Description Advantages Disadvantages		
Proof of Work	Here, the miners solve complex mathematical problems and whoever solves it first gets to add the block to the Chain.	1. Very secure due to complex mathematical processes. 2. It is Decentralized and used in major cryptocurrencies like Bitcoin.	1. Very high energy consumption, which affects the environment. 2. Slow transaction. 3. Vulnerable to attacks if only one person controls the majority of the mining and adding.

Different Types of Consensus

Proof of Stake	Here, validators, i.e. miners are invited to create a new block based on the number of cryptocurrencies they put at "stake."	1. Environment-friendly and energy efficient. 2. Faster transaction speed compared to PoW. 3. Not vulnerable to 51% attack	1. Those "Validators" who have a greater "stake" have greater control over the chain. 2. Those who put bigger stakes receive bigger rewards.

Different Types of Consensus

Delegated Proof of Stake	Everyone is allowed to vote for a limited amount of people who are responsible for new block creation and validation.	1. Scalable and Fast transaction. 2. uses less energy than PoW and is more decentralized than normal PoS.	1. As it depends on voting, those who get the maximum votes hold most of the power. 2. Due to this there might be some problems between them. People tend to vote less so that they can be selected as a candidate.

Different Types of Consensus

Proof of Importance	Consensus which is used in NEM Blockchain. Considers both the number of coins held as well as the number of transactions done by a single account while creating a block.	1. Anyone can participate. 2. Those who actively participate and contribute get rewarded.	1. Finding the importance of an account becomes tough sometimes. 2. Prone to Sybil attacks

Different Types of Consensus

Proof of Capacity/ Proof of Space	Miners need to use their storage to solve and mine cryptocurrencies.	1. Energy efficiency as compared to PoW. 2. The more storage they use, the better rewards they get	1. Miners allocating more space has the advantage. 2. Setup cost is high as the miners need to use their own device's space. 3. Miners can have some evil intentions.

Different Types of Consensus

Proof of Authority	The network approves some Block validators who validate already created blocks and can also create new blocks.	1. High transaction throughput with low latency. 2. Efficient, Scalable, uses less energy	1. It relies upon very few validators. 2. Less censorship due to more centralized control.

Different Types of Consensus

Proof of Burn	Miners burn coins allocated to them by the network to earn the rights to mine blocks.	1. Alternative of PoW and PoS. 2. Due to burning, reduces the supply of coins, the value of coins increases	1. The destruction process can't be reversed. 2. Limited use 3. The distribution of coins might not be the same.