SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution Accredited by NBA – AICTE and Accredited by NAAC – UGC with

'A' Grade Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
IOT Including CS&BCT

COURSE NAME : DISTRIBUTED LEDGER TECHNOLOGY

TOPIC : Stake, Space-Attacks on POW-Ethereum-Pos/POW Hybrids-Crypto currency to block chain 2.0

Stake & Attacks on Proof of Work (PoW)

What is Stake in Blockchain?

Stake refers to the amount of cryptocurrency a participant holds and locks up in the network to become a validator in Proof of Stake (PoS) systems. Unlike Proof of Work (PoW), where miners compete using computational power, PoS selects validators based on the number of coins they own and are willing to stake.

Importance of Stake:

Encourages long-term commitment to the network.

Reduces energy consumption compared to PoW mining.

Ensures better security as malicious behavior results in losing the staked amount.

Attacks on Proof of Work (PoW)

1. 51% Attack
2. Selfish Mining Attack
3. Sybil Attack
4. Eclipse Attack

Ethereum PoS/PoW Hybrid

Ethereum's Transition from PoW to PoS

Ethereum initially used Proof of Work (PoW) but gradually transitioned to Proof of Stake (PoS) to improve scalability, security, and energy efficiency.

Phases of Ethereum's Transition:

Ethereum 1.0 (PoW Era):

Used PoW for transaction validation.

Faced high gas fees and slow transaction speeds.

Ethereum 1.x (PoW/PoS Hybrid):

Introduced Beacon Chain, running PoS alongside PoW.

Allowed gradual shift to staking.

Ethereum 2.0 (Full PoS – The Merge):

Completely removed PoW mining.

Reduced energy consumption by over 99%.

Cryptocurrency & Blockchain 2.0

Cryptocurrency serves as a key component in blockchain ecosystems, facilitating transactions, incentivizing security, and powering decentralized applications.

Key Features of Blockchain 2.0

1. **Smart Contracts**
   - Self-executing contracts stored on the blockchain.
   - Eliminates intermediaries, reducing costs and delays.
2. **Decentralized Finance (DeFi)**
   - Enables lending, borrowing, and trading without banks.
   - Uses blockchain-based protocols like Uniswap and Aave.
3. **Tokenization**
   - Converts real-world assets (property, art) into digital tokens.
   - Examples: Non-Fungible Tokens (NFTs), Security Tokens.
4. **Interoperability**
   - Enables different blockchains to communicate.
   - Projects like Polkadot and Cosmos focus on multi-chain connectivity.

Examples of Blockchain 2.0 Projects:

Ethereum: Pioneer of smart contracts.

Binance Smart Chain: Fast transactions and DeFi support.

Cardano: Secure and scalable PoS-based blockchain.

Solana: High-speed blockchain for DApps.