Algorand Network

Topology and software powering Algorand

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Algorand™
FOUNDATION

Public Networks

- Mainnet
  - The main Algorand network where production applications live
- Testnet
  - A network for specifically made for testing
  - Running same software version as MainNet
- Betanet
  - Running future software versions

Configurable Modes

- Participation
  - Used to participate in consensus to secure network
  - Contains last ~1000 blocks
- Archival
  - Contains the entire blockchain
  - Required for indexer, which is used to query blockchain
- Relay
  - Routes data between participation nodes
  - Do not affect consensus

Decentralization

- 1000+ nodes

- Participation nodes are permissionless

- Default relay nodes are chosen by Foundation
  - Anyone can run one, but nodes must point to it

Consensus - Pure Proof of Stake

- Three Steps
  i. Block proposal: Accounts propose new blocks to the network

  ii. Soft Vote: Committee votes on proposals and filters down to one

  iii. Certify Vote: Separate committee votes to certify the block

- Selection
  - Each account generates random numbers via VRF

  - The amount of random numbers generated (thus chance of participating) is proportional to ALGO in account

  - New participants are selected for each step

Participating

- Requirements
  - Must be running participation node
  - Must register as online with *participation* key
  - Must have 0.1 ALGO
- Information
  - No explicit staking
  - No rewards
  - No slashing

Hardware Requirements

- Minimum requirements

  - 4 vCPU

  - 8GB RAM

  - 100 GB SSD (NVMe SSD recommended)

  - 100 Mbit broadband

- Enterprise-grade

  - 8 vCPU

  - 16GB RAM

  - 500GB NVMe SSD

  - 1Gbps broadband symmetrical with low latency connection to the network

Software

- algod - Algorand Daemon
  - The node software that connects with the rest of the network
  - HTTP endpoints for submitting transactions and reading state
- kmd - Key Management Daemon
  - Manages account keys
  - HTTP endpoints for managing and querying local accounts
- indexer
  - Software that can run alongside an archival node
  - Saves blockchain state in SQL database
  - Provides HTTP endpoints specifically for querying on-chain data

Interacting With Nodes

- goal
  - Command-line utility for interacting with algod and kmd

- SDKs
  - Leverage HTTP endpoints to interact with algod and kmd

- Public API services
  - Services that expose HTTP endpoints for their node(s) publicly

Installation

- sandbox
  - Leverages docker to quickly deploy a node
  - Often used for local networks for development and testing
- Manual installation
  - Compile from source
  - Update script for automated install
  - Package manger on debian-based or RedHat-based operating systems