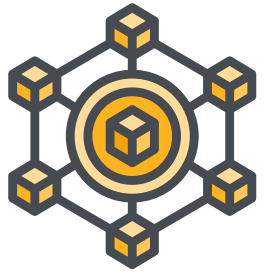
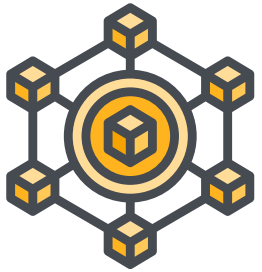
✅ What is The Graph Protocol?

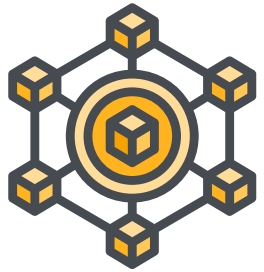


- An indexing and querying protocol for blockchain data
- Often called the “Google of blockchains”
- Lets developers fetch smart contract data easily
- Uses GraphQL for fast and flexible queries
- Widely used in DApps and DeFi apps

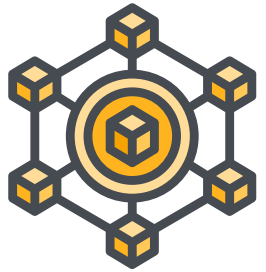


❗ The Problem

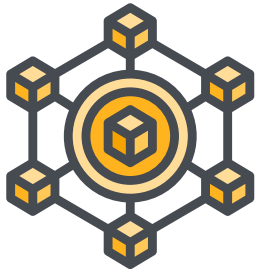
Why We Need The Graph?



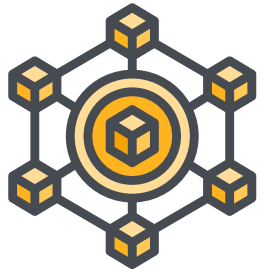
- Blockchain data is hard to read directly
- Smart contracts store raw, unstructured data
- Reading events manually is slow and complex
- Running full nodes and custom indexers is expensive
- Frontends struggle to efficiently query on-chain data



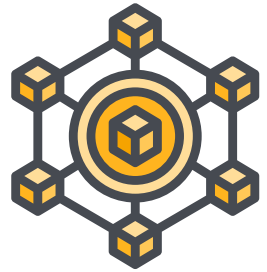
💡 The Solution



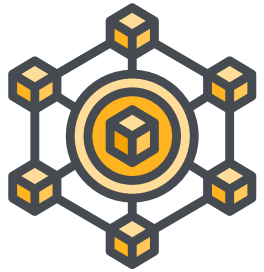
- The Graph indexes blockchain data automatically
- Creates Subgraphs (custom data APIs)
- Developers query data using simple GraphQL
- No need to build your own indexing server
- Faster, cheaper, and developer-friendly



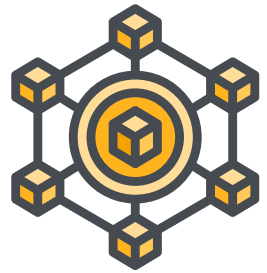
🏗 Architecture of The Graph Protocol



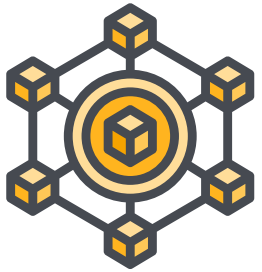
- Smart Contracts → emit events
- Subgraph → defines what data to index
- Graph Node → processes and indexes data
- GraphQL API → frontend queries data
- Decentralized Network → serves queries



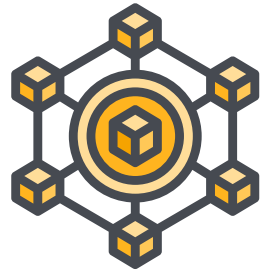
Network Roles



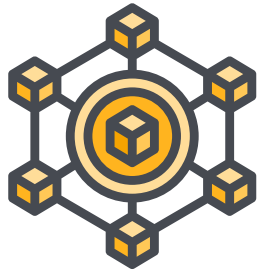
- Indexer — runs nodes and indexes data
- Curator — signals useful subgraphs
- Delegator — stakes tokens with indexers
- Consumer — queries the data (DApps)



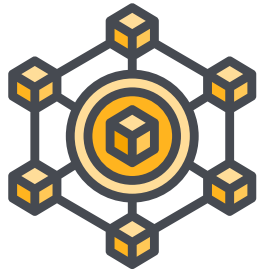
📁 Subgraph Files



- Main files in a subgraph:
- subgraph.yaml
- → defines data sources and events
- schema.graphql
- → defines data structure
- mapping.ts
- → transforms blockchain events into entities



🚀 Use Cases



- DeFi dashboards
- NFT marketplaces
- Blockchain analytics
- DAO voting apps
- Gaming leaderboards
- Any data-heavy DApp