P2P01 Database Management System Comparison

Background

We are collecting a plethoraof data on different Peer-To-Peer networks like IPFS, Ethereum, Polkadot, Filecoin, Celestia and more. This data is currently stored in a Postgres database. For analytical queries this might not be the optimal solution. So called OLAP tasks might be better performed by columnar data stores. In this seminar topic you should take the production data, import it into different database management systems, run typical queries, document the performance and also explain why certain systems are better suited than others.

Preferred Qualifications: Python, SQL

Goal

- Carry out a systematic performance comparison of different database management systems on real data

Tasks

- Compile a list of potential DBMS's (e.g., ClickHouse, DuckDB, MongoDB, MySQL, SQLite)

- Design a schema for each selected DBMS and import the production data

- Run typical queries (provided by us) against the DBMS and compare the performance

- Analyze and Explain why certain systems perform the way they do

Dennis Trautwein

trautwein@gipplab.org

Moritz Schubotz

Moritz.Schubotz@ fiz-karlsruhe.de

P2P02 Comparative Data Analysis on P2P Networks

Background

We are collecting a plethoraof data on different Peer-To-Peer networks like IPFS, Ethereum, Polkadot, Filecoin, Celestia and more. While analyses exist for individual networks, there are no studies that compare characteristics of the different networks. In this seminar topic you will take our data and produce comparative visualizations.

Preferred Qualifications: Python, SQL

Goal

- Produce visualizations to compare key characteristics from different peer-to-peer networks and compile them into a self-contained report.

Tasks

- Get familiar with our data sets on peer-to-peer networks and examine our existing visualizations

- Compile a list of suitable comparative visualizations

- Query our database and feed the data into visualization tools

- Interpret the data by accompanying the graphs with explanatory text in a report-style document

Dennis Trautwein

trautwein@gipplab.org

Moritz Schubotz

Moritz.Schubotz@ fiz-karlsruhe.de

P2P03 Historical Analysis on P2P Networks

Background

We are collecting a plethoraof data on different Peer-To-Peer networks like IPFS, Ethereum, Polkadot, Filecoin, Celestia and more. While analyses we have weekly aggregation of metrics, the granularity is in the order of days or even hours. To identify long-term trends and get a birds-eye view on what is going on in the network, week-on-week analyses would help. In this seminar topic you will take our data and produce visualizations that cover long time scales.

Preferred Qualifications: Python, SQL

Goal

- Produce visualizations to detect long-term trends in metrics for our measured peer-to-peer networks

Tasks

- Get familiar with our data sets on peer-to-peer networks and examine our existing visualizations

- Query our database and feed the data into visualization tools

- Interpret the data by accompanying the graphs with explanatory text in a report-style document

Dennis Trautwein

trautwein@gipplab.org

Moritz Schubotz

Moritz.Schubotz@ fiz-karlsruhe.de