

Web-based process discovery tool for Ethereum applications

Thesis C Presentation

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Outline

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 - Expected Outcomes
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Project Description

- Motivation:
 - Use tools to understanding user behaviour and monitor the process of smart contract.
 - To have multiple functions within one tool.
 - To provide an intuitive visualisation of the application.
- Aim:
 - Develop a tool provides a web-based analytics dashboard for using process discovery to analyse smart contracts that are deployed on Ethereum.

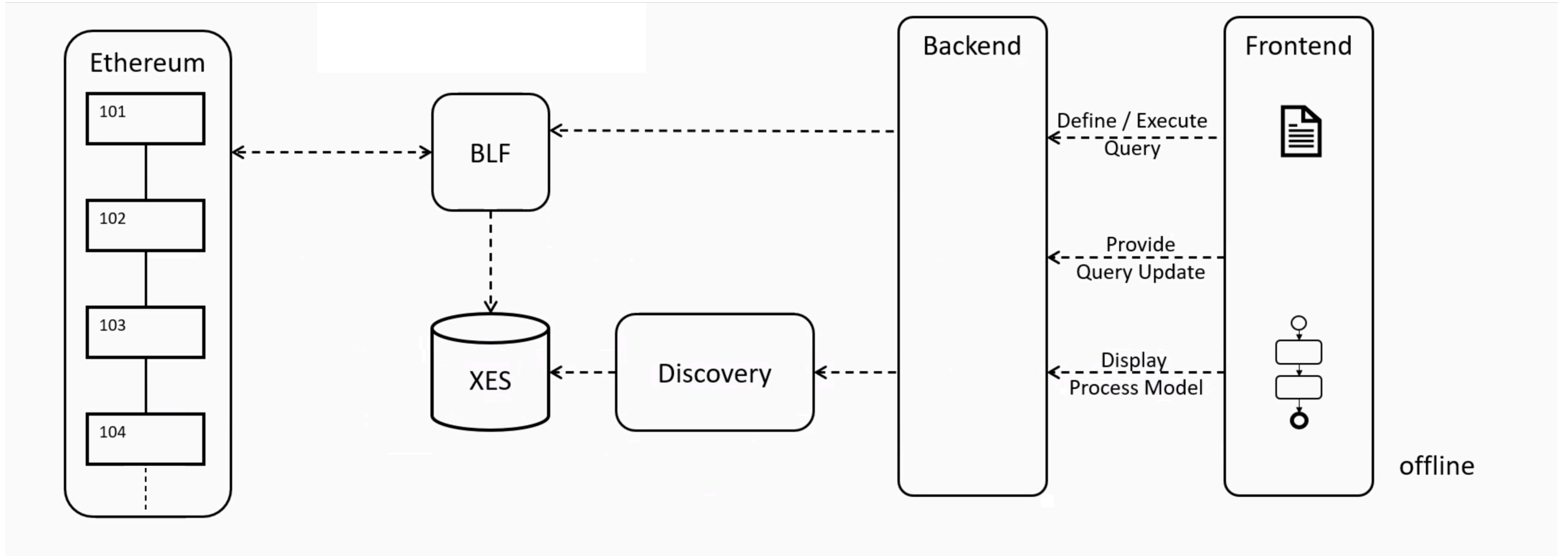
Expected/Current Outcomes

- Integrate the data extraction function implemented by Blockchain Logging Framework (BLF).
 - Users are able to compose, upload and save their own query.
 - Users are able to validate and execute the query.
- Provide process discovery analysis function.
 - Generate the Directed-Follows-Graph (DFG).
- Connecting the whole process with a single dashboard.
 - Interactive responsive interface.

Demo

- For CryptoKitties, discover the actual process.

Project architecture



Event Log Extraction

- Functionality
 - Event log: Extract, transform, format and export (XES).
 - A query language and validate the query language.
- Technology
 - Blockchain logging framework.
 - Ethereum networks.
- Problems
 - Filters adapt with certain private networks.

Process Discovery

- Functionality
 - Visualisation techniques.
 - Transform the data.
- Technology
 - Directly-Follows Graph (DFG)
 - Dagne
- Problems
 - Layout algorithm & time efficiency

Integration

- Functionality
 - BLF query compose, import, validation, download and execute
 - Logs import, visualise for process discovery
 - Usability improvement
- Technology
 - ReactJS/HTML/CSS => interact with user & present
- Problems
 - Handle request & execution

Conclusion

- What does the tool bring:
 - Entire process is less fragmented.
 - Easier to perform process discovery on Blockchain data.

| Planned tasks | Completeness |
|--------------------------|---|
| Integration of each part | Connecting each components |
| Usability improvement | Responsive interactive interface / UI improvement |
| DFG algorithm | Dagre D3 package |
| Additional functionality | Query saving/XES uploading/ result downloading |
| Conformance checking | Out of scope for thesis c |

Future Work

- Enable the user to do more analysis
 - More process discovery algorithms
 - Support more process mining techniques.
- To improve the performance
 - Speed up the entire analysis process
 - Extracting speed/mining speed

Thank you

Reference

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