Performance Metrics

The developed Ethereum smart contract for drug traceability was analyzed using specialized tools to reveal any code vulnerabilities in addition to the aforementioned security analysis. Those tools were used in code development iterations to improve the reliability of the smart contract. Remix IDE that was used to develop the smart contract provides some code debugging and run-time error warnings. However, they are not sufficient to establish trust in the smart contract robustness. Smart Check was used to detect vulnerabilities in the code at different severity levels. After multiple iterations of smart code modification, the smart code was bug-free as reported by the output. Smart Check analyzed the smart contract comparing it to its knowledge base and verified that it was free from risks that would make it susceptible to exploitation and cyber-attacks. Oyente tool was also used to explore the smart contract security.

RESULTS

In this paper, we discuss how blockchain technology can be leveraged for drug traceability application in the pharmaceutical supply chain. We proposed two blockchain architectures based on Hyperledger Fabric and Hyperledger Besu. Such architectures provide a shared, trusted, permissioned and decentralized platform for storage and communications among different pharmaceutical supply chain stakeholders, and in a manner that can fulfill key requirements and features that include security, privacy, accessibility, transparency, and scalability. We present a comparison of the two platforms, and outlined a number of implementation challenges that hinder the wide spread adoption of blockchain technology for effective drug traceability.

Output Screenshots: