HDS Serenity Ledger

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Abstract

Your abstract text goes here. Just a few facts. Whet our appetites. Not more than 200 words, if possible, and preferably closer to 150. ONLY IF WE HAVE SPACE

1 System Design Overview

Our highly dependable system follows a layered architecture designed for scalability and fault tolerance. Let's delve into the key components:

1. **Client Application Interface:** This user-facing layer acts as the entry point for user interactions. It captures user requests and transmits them securely to the Client Service.

2. **Client Service:** This background service acts as a mediator between the Client Application and the server-side logic. It receives requests from the Client Application, performs signature validation (using cryptographic techniques), and broadcasts the message to the relevant server-side service.

3. **SerenityLedgerService:** This core server-side service receives messages broadcasted by the Client Service. It acts as the central coordinator, orchestrating the overall message processing flow. It prepares the data based on the received message and interacts with the Node Service to retrieve the consensus value.

4. **Node Service:** This specialized service encapsulates the logic for reaching consensus on a specific value. It interacts with SerenityLedgerService to receive the prepared data and leverages a defined consensus mechanism (Instambul Byzantine Fault Tolerance) to reach an agreement with other nodes. If consensus is achieved, the resulting ledger state is returned to the SerenityLedgerService.

5. **Communication Flow:** The communication primarily follows a client-server model. User interactions initiate at the Client Application, which transmits requests to the Client Service. The Client Service broadcasts the message to the designated SerenityLedgerService on the server side. SerenityLedgerService then interacts with the Node Service to reach consensus on a value. Finally, the agreed-upon ledger state is potentially relayed back to the Client Service for further processing or user notification.

This layered architecture promotes modularity and separation of concerns. Each layer has a well-defined responsibility, improving maintainability and promoting easier integration of future functionalities. The use of a dedicated Node Service for consensus allows for flexibility in exploring different consensus algorithms depending on the specific needs of the system.

2 Relevant Implementation Aspects

The most relevant implementation aspects; cite something like [1].

3 Behavior under attack

The experimental evaluation that shows that the system is dependable in the presence of Byzantine behavior.

References

[1] Moniz H. The istanbul bft consensus algorithm, 2020. https://arxiv.org/pdf/2002.03613.pdf.