KINLEND PROTOCOL

Protocol Requirements

For Borrower:

- The protocol shall allow a user to **Create a Loan Request.**

  While Creating Loan Request:

  - The protocol shall allow a user to Deposit Collateral (SOL) and it should be Over-Collateralized.
  - The protocol shall allow a user to Set Borrowed Amount (USDC).
  - The protocol shall allow a user to Set Deadline for Repaying.
- The protocol shall allow a user to Withdraw/Unlock Collateral if None has Funded or Accepted Loan Request.
- The protocol shall not allow a user to Withdraw/Unlock Collateral if Someone Funds/Accepts Loan Request.
- The protocol shall allow a user to repay borrowed USDC to the Lender before Deadline expires.
- The protocol shall ask a user to pay 5% service fee while repaying borrowed USDC.
- The protocol shall transfer locked collateral to a user after he repays to Lender.

For Lender:

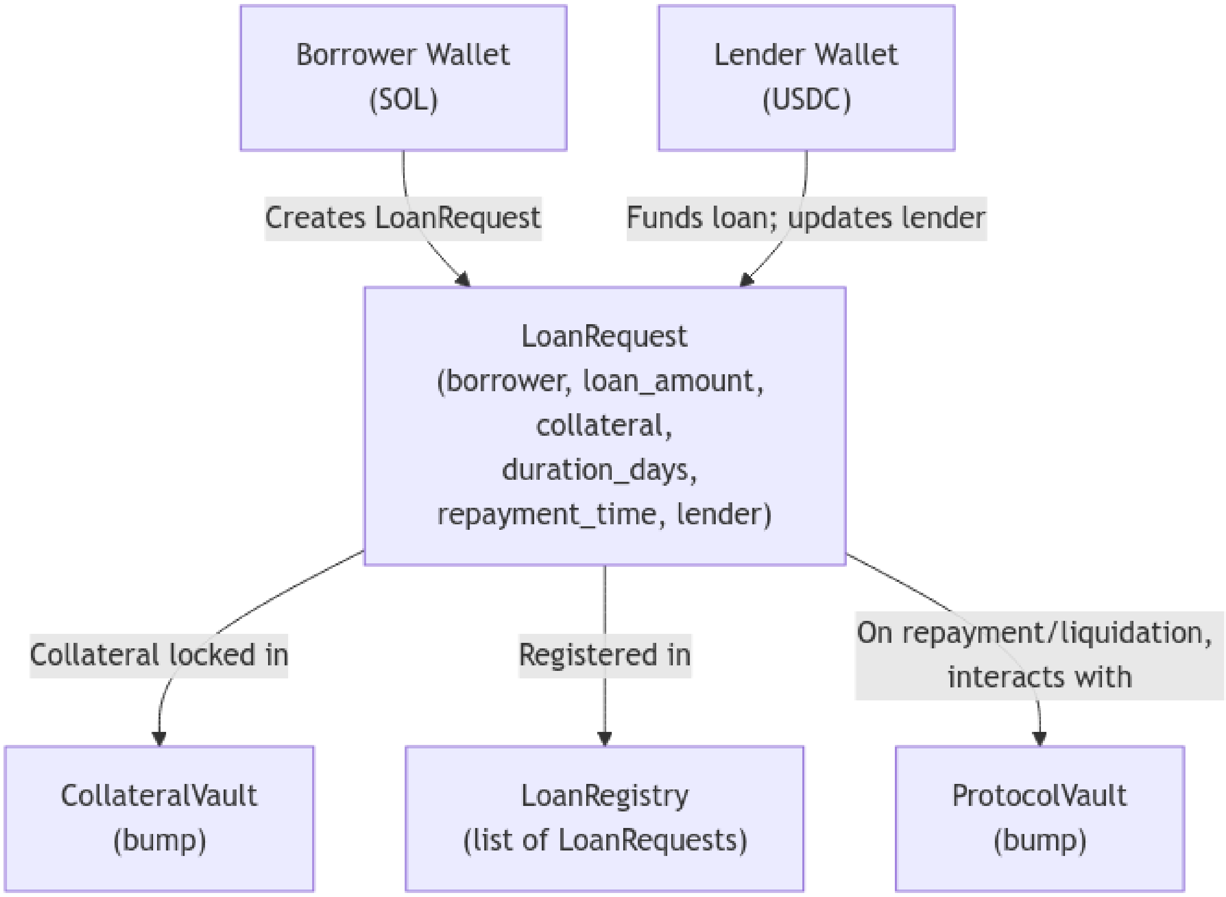
- The protocol shall allow a user to browse a list of Loan Requests.
- The protocol shall allow a user to accept any Loan Request.

  While Accepting Loan Request:

  - The protocol shall allow a user to send USDC to Borrower.
- The protocol shall allow a user to Claim USDC and Fee (4%) if Borrower repays before Deadline.
- The protocol shall allow a user to Claim Collateral(SOL) if Borrower fails to repay.
- The protocol shall allow a user to withdraw his collateral after his repays to Lender.

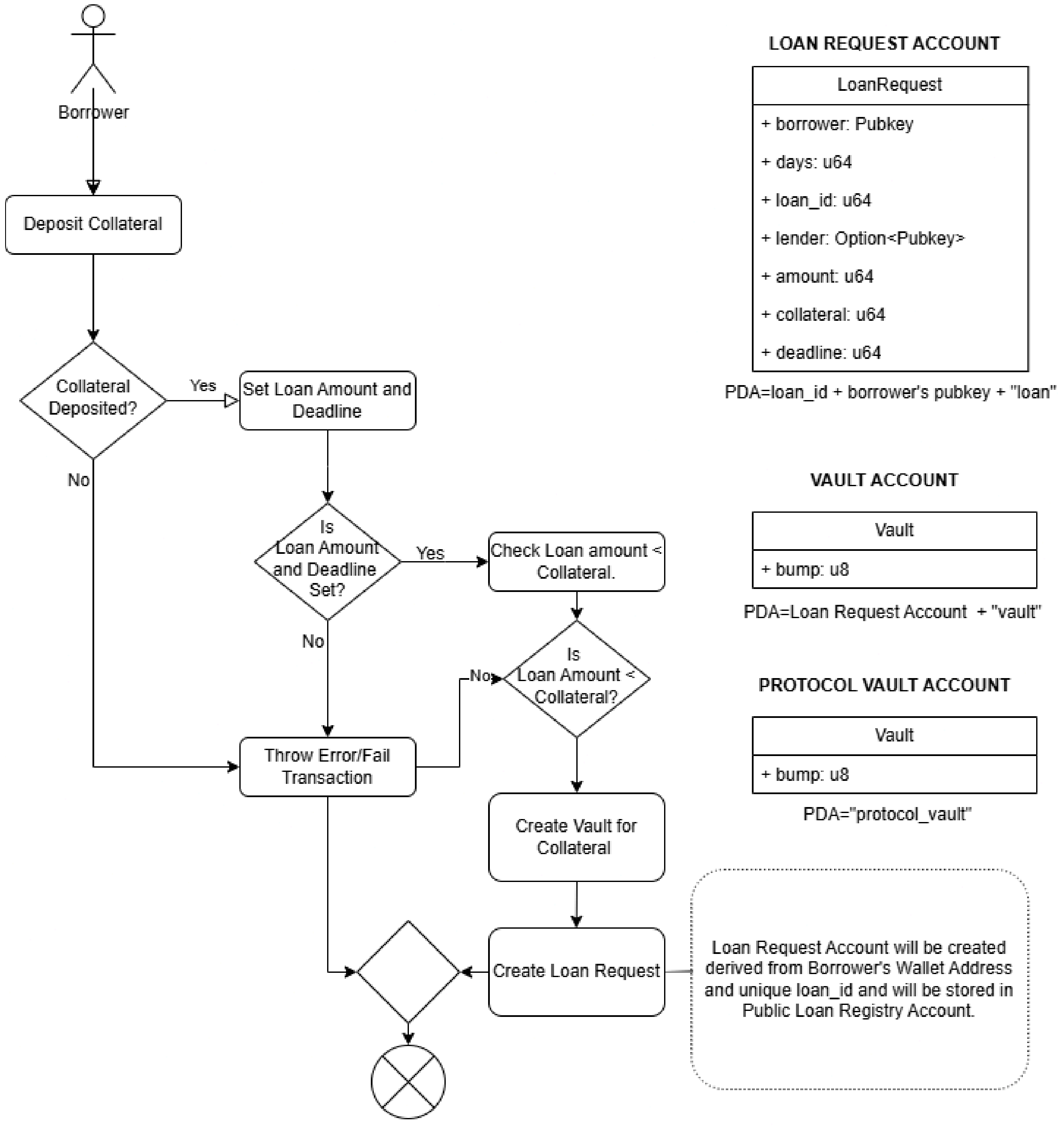
- The protocol shall Store all Loan Requests created by Borrowers
- The protocol shall allow Lender to claim collateral if value becomes 110% of loaned Amount.
- The protocol shall List all Loan Requests which are funded or available for funding.
- The protocol shall use a separate Vault for each Loan Requests Created by Borrower.

Overview


Borrower Wallet (SOL)
Lender Wallet (USDC)
Creates LoanRequest
Funds loan; updates lender
LoanRequest (borrower, loan_amount, collateral, duration_days, repayment_time, lender)
Collateral locked in
Registered in
On repayment/liquidation, interacts with
CollateralVault (bump)
LoanRegistry (list of LoanRequests)
ProtocolVault (bump)

1. **Borrower Wallet:**
   Creates the LoanRequest.
2. **LoanRequest:**
   Stores key fields: borrower, loan_amount, collateral, duration_days, repayment_time, and lender.
3. **CollateralVault:**
   A dedicated vault (with its bump) that holds the SOL collateral for the loan.
4. **LoanRegistry:**
   A global account that maintains a list of all active LoanRequests.
5. **Lender Wallet:**
   Funds the loan, which updates the lender field in the LoanRequest.
6. **ProtocolVault:**
   A global vault (with its bump) that collects fees during repayment or liquidation

Create Loan Request


Borrower
Deposit Collateral
Collateral Deposited?
Yes
No
Set Loan Amount and Deadline
Is Loan Amount and Deadline Set?
Yes
No
Check Loan amount < Collateral.
Is Loan Amount < Collateral?
No
Throw Error/Fail Transaction
Create Vault for Collateral
Create Loan Request

Loan Request Account will be created derived from Borrower's Wallet Address and unique loan_id and will be stored in Public Loan Registry Account.

LOAN REQUEST ACCOUNT

LoanRequest

+ borrower: Pubkey
+ days: u64
+ loan_id: u64
+ lender: Option<Pubkey>
+ amount: u64
+ collateral: u64
+ deadline: u64

PDA=loan_id + borrower's pubkey + "loan"

VAULT ACCOUNT

Vault

+ bump: u8

PDA=Loan Request Account + "vault"

PROTOCOL VAULT ACCOUNT

Vault

+ bump: u8

PDA="protocol_vault"

The borrower will set the amount of SOL he wants to deposit as collateral.

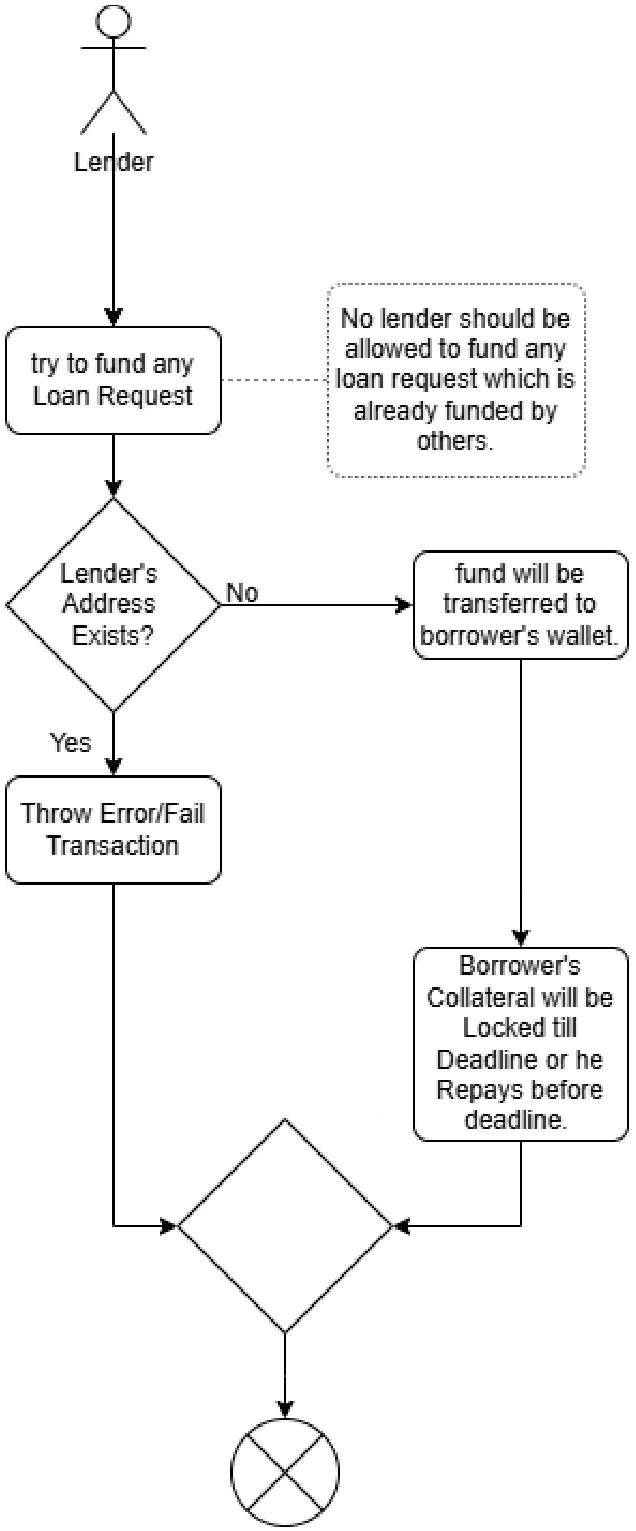
The collateral amount must be 150% of the borrowed amount, and the maximum borrowable amount cannot exceed 100% of the eligible limit.

Borrower will set deadline and amount of USDC he wants to borrow.

Vault(PDA) will be created and collateral will be transferred there.

Loan Request will be created and information will be stored in Public Loan Registry.

Fund Loan


Lender
try to fund any Loan Request
No lender should be allowed to fund any loan request which is already funded by others.
Lender's Address Exists?
No
fund will be transferred to borrower's wallet.
Yes
Throw Error/Fail Transaction
Borrower's Collateral will be Locked till Deadline or he Repays before deadline.

Any Lender can fund Loan or Accept Loan request.

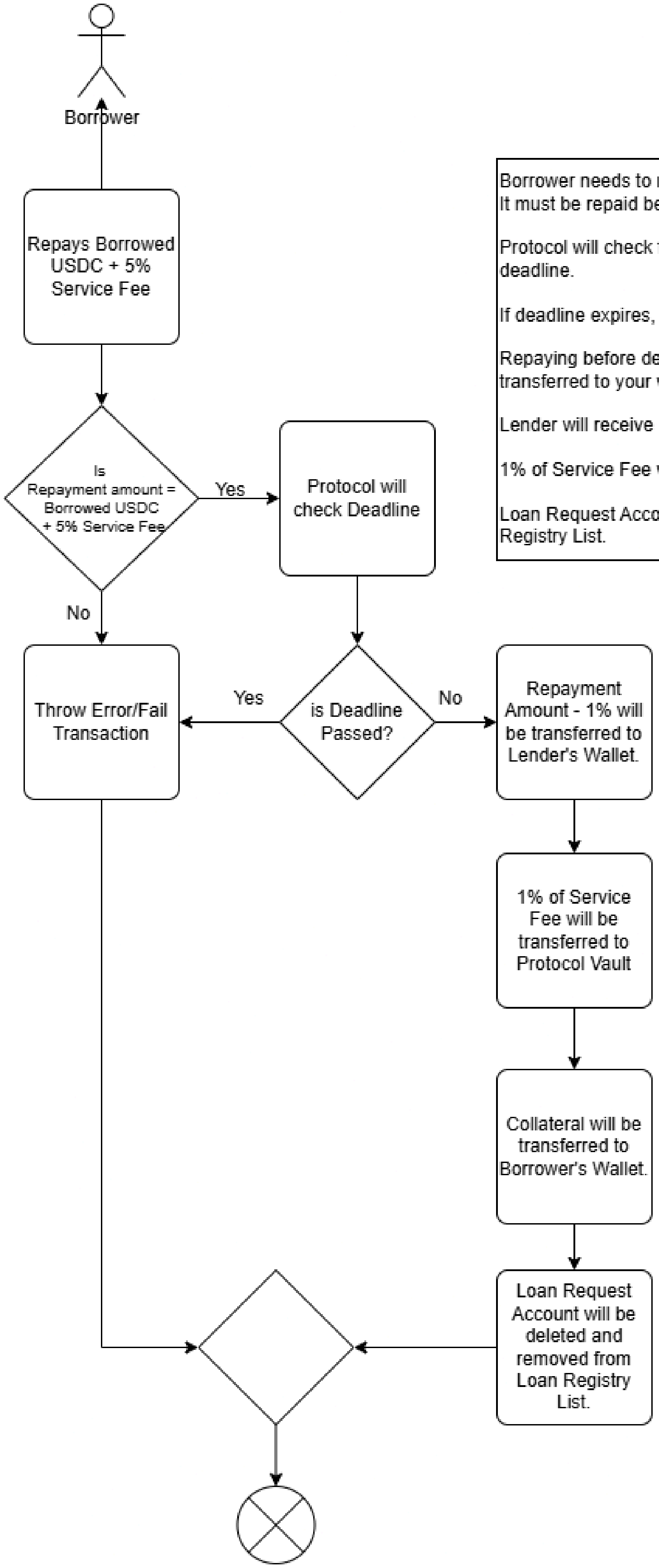
Protocol will check if given Loan Request is already funded or not.

If it is not funded then Lender will be able to fund loan.

Asked USDC token will be transferred to Borrower's Wallet.

Current Loan Request Account will contain Lender address which will be helpful to check funded or non-funded loan request.

Repaying Loan


Borrower
Repays Borrowed USDC + 5% Service Fee
Is Repayment amount = Borrowed USDC + 5% Service Fee
Yes
No
Protocol will check Deadline
is Deadline Passed?
Yes
No
Throw Error/Fail Transaction
Repayment Amount - 1% will be transferred to Lender's Wallet.
1% of Service Fee will be transferred to Protocol Vault
Collateral will be transferred to Borrower's Wallet.
Loan Request Account will be deleted and removed from Loan Registry List.

Borrower needs to repay borrowed amount + 5% Service fee.
It must be repaid before deadline expires.

Protocol will check for deadline and if current time is less than or equal to deadline.

If deadline expires, all the collateral will be claimed by Lender as Reward.

Repaying before deadline expires will unlock your collateral and will be transferred to your wallet.

Lender will receive borrowed USDC and 4% of Service Fee.

1% of Service Fee will be reserved for protocol.

Loan Request Account will be closed and removed from Public Loan Registry List.

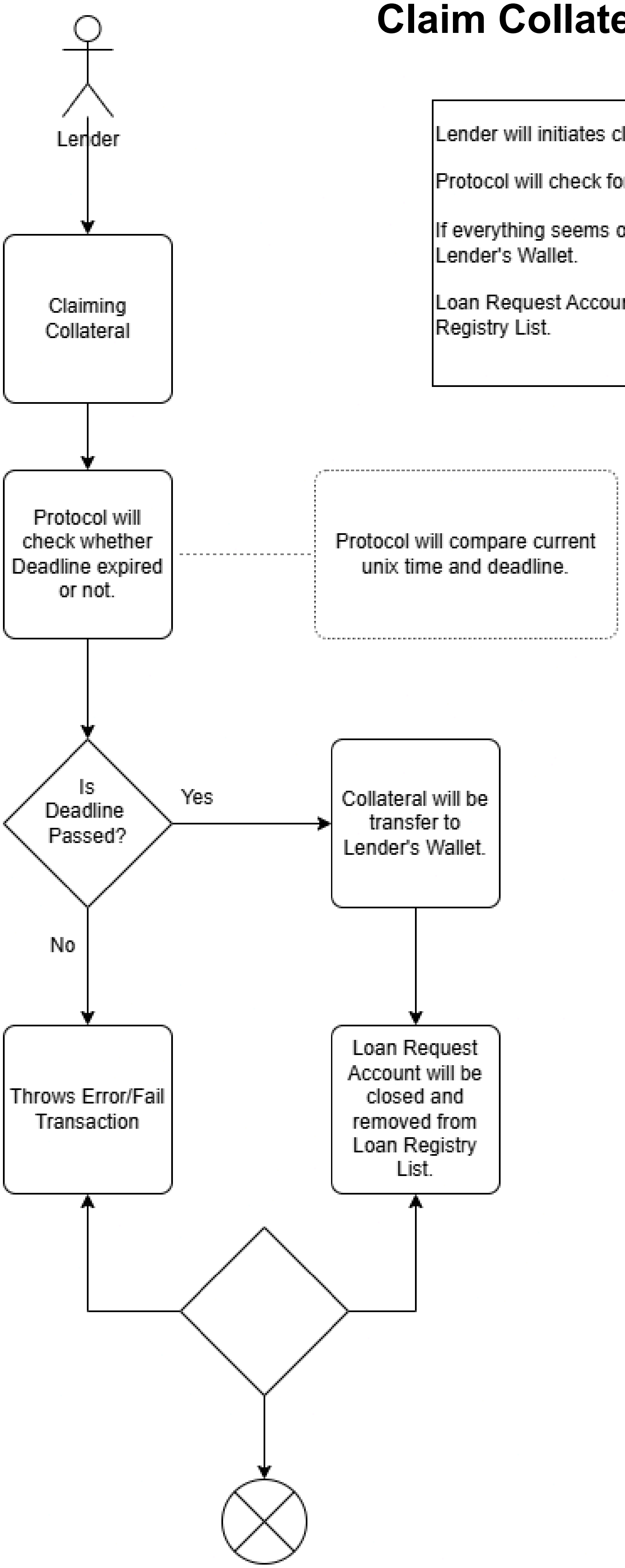
Claim Collateral

Lender will initiates claiming collateral function.

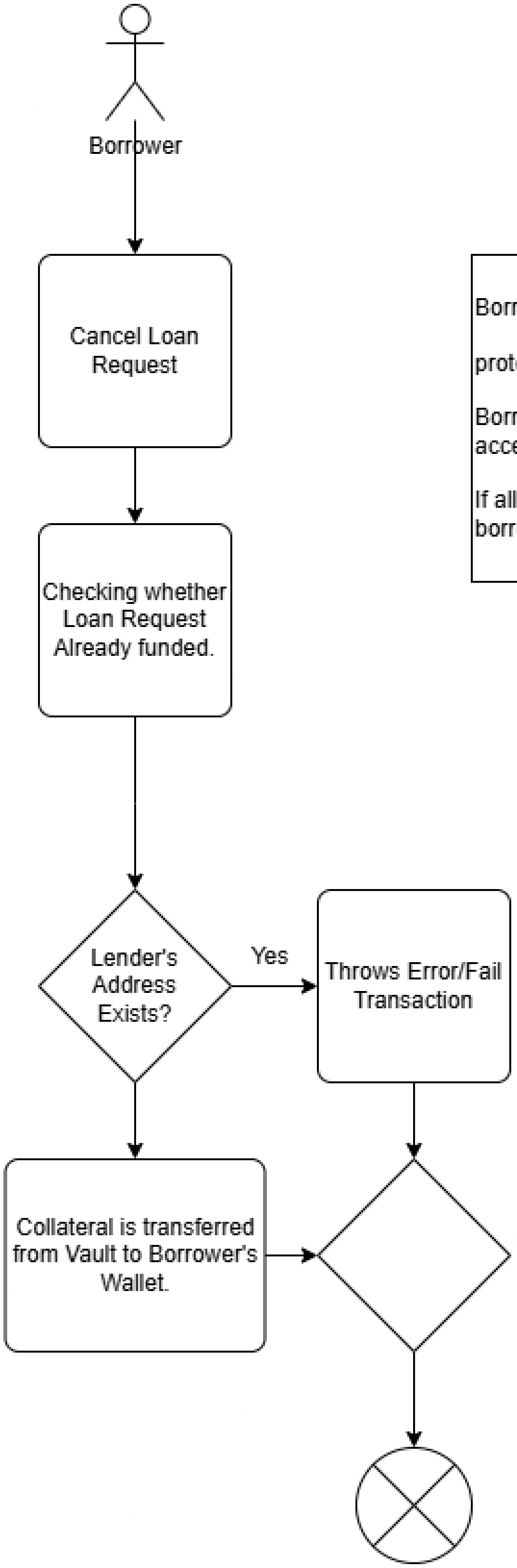
Protocol will check for deadline.

If everything seems okay, Collateral will transferred from Vault to Lender's Wallet.

Loan Request Account will be closed and removed from Public Loan Registry List.


Lender
Claiming Collateral
Protocol will check whether Deadline expired or not.
Protocol will compare current unix time and deadline.
Is Deadline Passed?
Yes
Collateral will be transfer to Lender's Wallet.
No
Throws Error/Fail Transaction
Loan Request Account will be closed and removed from Loan Registry List.

Remove Collateral


Borrower
Cancel Loan Request
Checking whether Loan Request Already funded.
Lender's Address Exists?
Yes
Throws Error/Fail Transaction
Collateral is transferred from Vault to Borrower's Wallet.

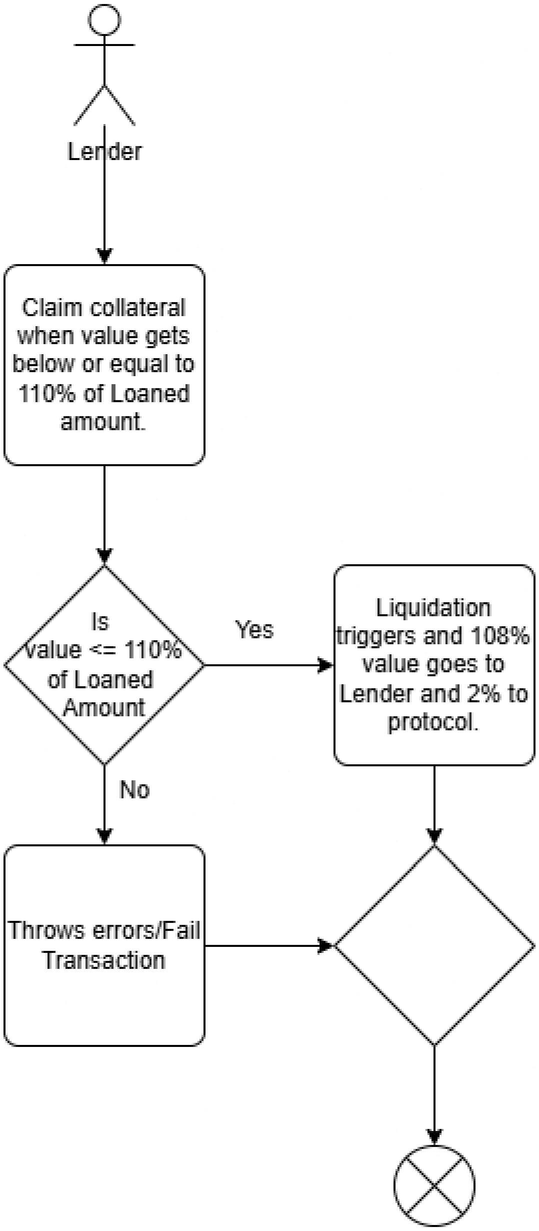
Borrower can cancel their Loan Request and remove their collateral.

protocol will check whether Loan Request already accepted or not.

Borrower cannot remove or unlock collateral if Loan Request already accepted.

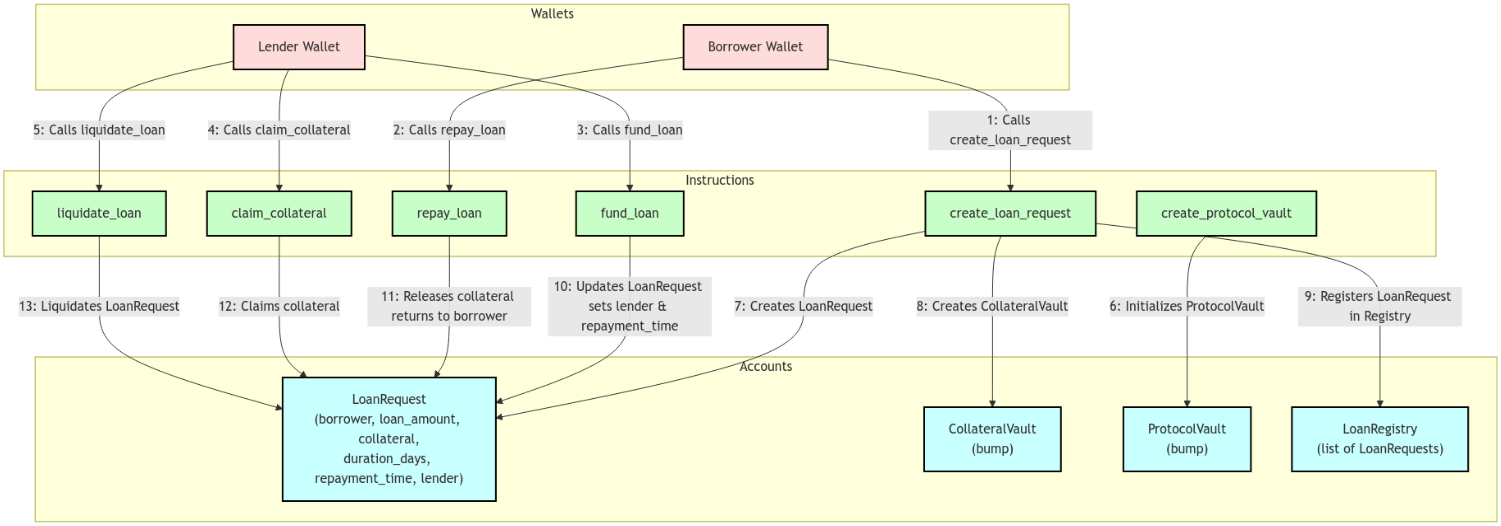
If all everything seems fine, protocol transfers collateral from vault to borrower's wallet.

Liquidation


Lender
Claim collateral when value gets below or equal to 110% of Loaned amount.
Is value <= 110% of Loaned Amount
Yes
No
Liquidation triggers and 108% value goes to Lender and 2% to protocol.
Throws errors/Fail Transaction

User deposits collateral: Let's say Saber deposits **$150** worth of SOL.
User borrows funds: Alice takes a loan of **$100 USDT**.
Collateral value decreases: Due to market volatility, SOL drops in price, and the collateral is now worth **$110**.
Liquidation is triggered: Since the collateral has fallen to **110% of the loan amount**, it is liquidated.
Lender gets repaid: The protocol transfers the collateral($108), ensuring the lender recovers their funds and protocol takes $2 as service fee.

End to end Overview


Wallets
Lender Wallet
Borrower Wallet
5: Calls liquidate_loan
4: Calls claim_collateral
2: Calls repay_loan
3: Calls fund_loan
1: Calls create_loan_request
Instructions
liquidate_loan
claim_collateral
repay_loan
fund_loan
create_loan_request
create_protocol_vault
13: Liquidates LoanRequest
12: Claims collateral
11: Releases collateral returns to borrower
10: Updates LoanRequest sets lender & repayment_time
7: Creates LoanRequest
8: Creates CollateralVault
6: Initializes ProtocolVault
9: Registers LoanRequest in Registry
Accounts
LoanRequest (borrower, loan_amount, collateral, duration_days, repayment_time, lender)
CollateralVault (bump)
ProtocolVault (bump)
LoanRegistry (list of LoanRequests)

create_loan_request (7, 8, 9):

- Called by the Borrower Wallet to create a LoanRequest (fields: borrower, loan_amount, collateral, duration_days, repayment_time, lender) and its own CollateralVault (stores bump).
- Also registers the new LoanRequest in the LoanRegistry.

create_protocol_vault (6):

- Initializes the global ProtocolVault (stores bump) for fee collection.

fund_loan (10):

- Called by the Lender Wallet; updates the LoanRequest with the lender's key and sets the repayment_time (starting from funding).

repay_loan (11):

- Called by the Borrower Wallet; processes repayment and returns collateral from the CollateralVault.

claim_collateral (12):

- Called by the Lender Wallet if the borrower defaults; transfers collateral to the lender.

liquidate_loan (13):

- Triggered (with current price from Switchboard) when collateral value falls below a threshold; collateral is split between lender and protocol.