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Financial Bonds Tokenization

This project demonstrates the issuance and management of financial bonds through the ERC-7092 standard. This standard allows the issuance of bond tokens on the blockchain, their transfer among approved users, and their redemption at maturity. The standard also includes cross-chain functionalities to allow bond tokens to be managed across several blockchains.

For this project, the following contracts have been implemented:

- IdentityRegistry: This contract simulates the registration of users to an external Identity Registry.

- BondTopos: This contract inherits the ERC-7092 interface and allows to issue, transfer and redeem bonds.

- ToposBank: This is the main smart contract where most of the call on bonds should be initiated. It allows to register issuers and investors, to submit deals, to approve deals, to register for a deal.

- BondFactory: This contract allows to deploy a bond token contract for a given deal.

- BondCall: This contract acts as an API interface for any bond contract. It takes the bond contract address as parameter, and makes calls to fetch data or from the contract or to make transactions.

- IssuersFund: This contract is where investors send their investments when investing in a deal. When the issue volume is reached, the bond manager transfers funds to the issuer. The platform takes some fees that are transferred to 'ToposTreasury' contract.
- Exchange: The exchange contract allows to trade bonds on the secondary market. Bonds can be listed, unlisted, updated by the seller. Other investors can buy bonds listed on the exchange.

Core protocol

At its core, the platform uses the ERC-7092 standard for financial bonds. This standard allows to create tokens that represent a loan made by an investor to a borrower. The standard also includes functionalities that allow to calculate the coupons the borrower needs to pay to investors, and when the principal should be repaid to investors.

Architecture

The following figure shows the platform architecture. As we can see, there are three layers: the issuer layer, the pool layer, and the investor layer. The pool layer is described by the *IssuersFund* contract. The issuer and investor layers are managed by the *ToposBank* contract. For this project, the platform native token is not implemented, therefore, investors receive only a bond that guarantees the coupon payment and the principal repayment at maturity.