**Overview**

RuneBridge is a groundbreaking, permissionless solution designed to connect the Bitcoin and Core ecosystems. This bridge facilitates the seamless transfer of Bitcoin Runes to the Core blockchain, unlocking vast opportunities for decentralized finance (DeFi) and other innovative applications.

**Key Features**

* Permissionless Bridge: Operates without central control, allowing any user to transfer Bitcoin Runes to the Core blockchain effortlessly.
* Enhanced Security: Utilizes the robust security features of both Bitcoin and Core blockchains, ensuring safe and reliable transactions.
* DeFi Integration: Enables the creation and deployment of DeFi products for Bitcoin Runes on the Core blockchain, opening new avenues for financial innovation.
* EVM Compatibility: Leverages Core’s Ethereum Virtual Machine (EVM) compatibility, allowing developers to create and deploy smart contracts and dApps with ease.
* Scalability and Efficiency: Combines Bitcoin’s Proof-of-Work (PoW) with Core’s Delegated Proof-of-Stake (DPoS) through the Satoshi Plus consensus mechanism, providing a scalable and efficient platform for transactions.

**Technical Specifications**

**Smart Contract**

* **Purpose**: Records transaction details from users.
* **Deployment**: Deployed on the Core blockchain.
* **Functions**:
  + Record transaction details from users.
  + Interface with the off-chain relayer.
  + Manage ERC20 token deployment and transfers.

**Off-Chain Relayer**

* **Purpose**: Tracks and validates transactions.
* **Operations**:
  + Monitors the RuneBridge's hot wallet for incoming transactions.
  + Validates transaction details and confirms them.
  + Triggers the deployment of new ERC20 tokens on the Core blockchain.
  + Facilitates the transfer of tokens to the user's destination address.
* **Technology**: Built using NodeJS.

**Factory ERC20 Contract**

* **Purpose**: Facilitates the deployment of ERC20 tokens.
* **Operations**:
  + Deploys new ERC20 tokens when a new rune is bridged.
  + Ensures each token is uniquely associated with the corresponding Bitcoin Rune.
* **Features**: Supports scalable and efficient token creation.

**Frontend**

* **Technology**: Vite with React and TypeScript.
* **Purpose**: Provides a user interface for interacting with the bridge.
* **Functions**:
  + Transaction initiation from EVM-compatible wallet (Metamask, etc) and Unisat.
  + Display of token balances and transfer statuses