CH D S S S BABA (23A91A05E9) - Web3 Basics Exploration

Submission Date: December 17, 2025

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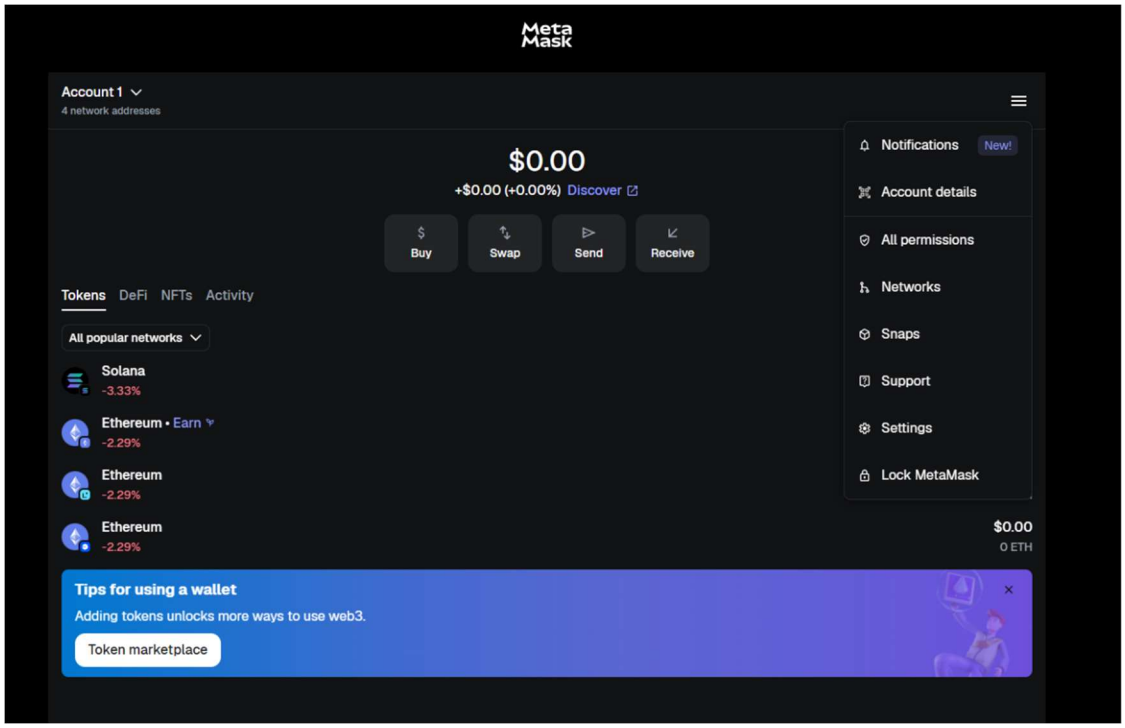
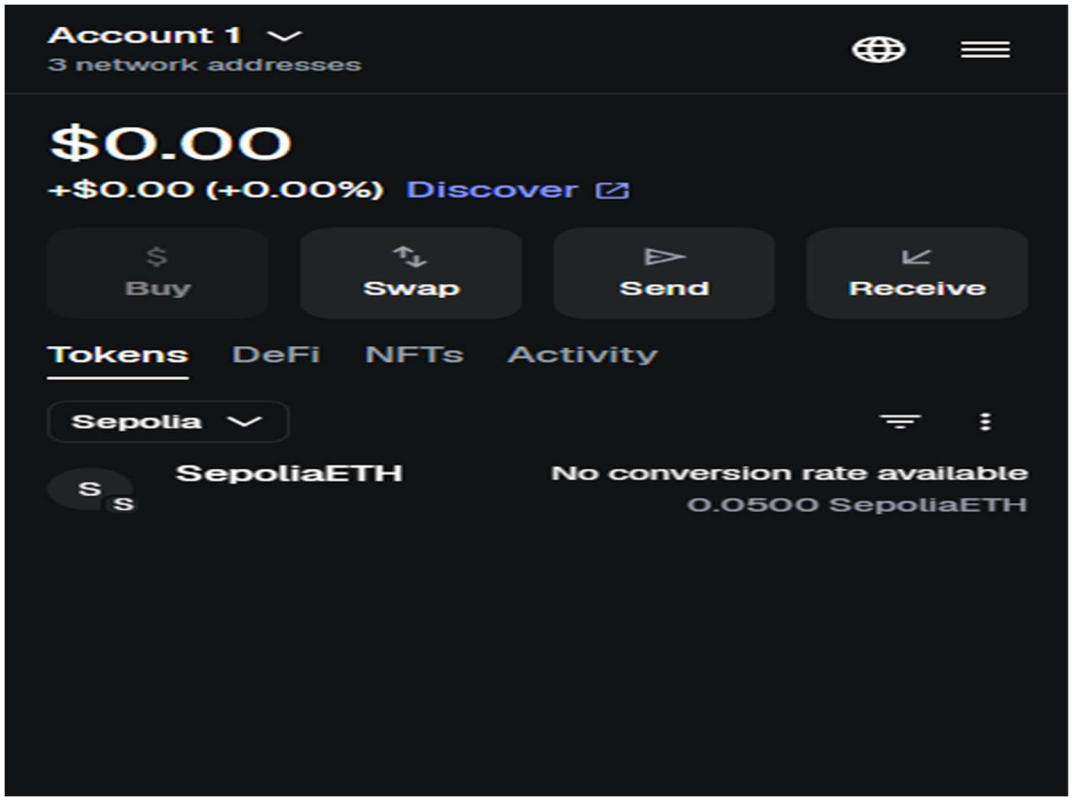
1. Documentation

1.1. Screenshots

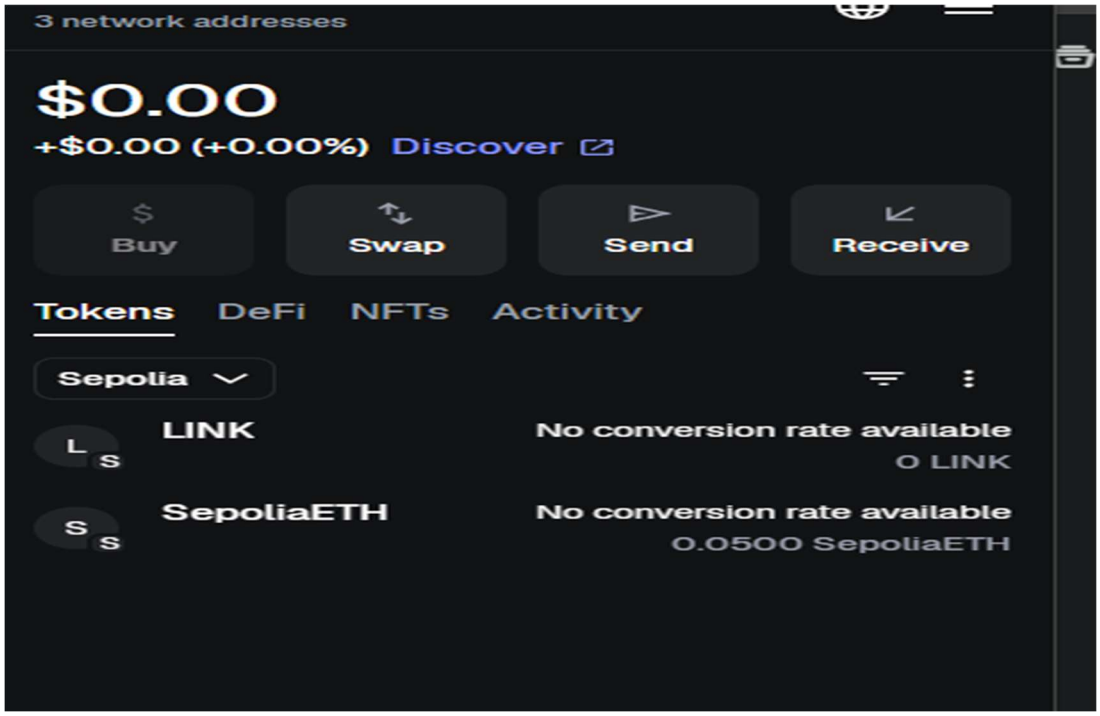
1. **MetaMask Setup & Network Configuration (Sepolia)**



Initial Interface after creating a wallet

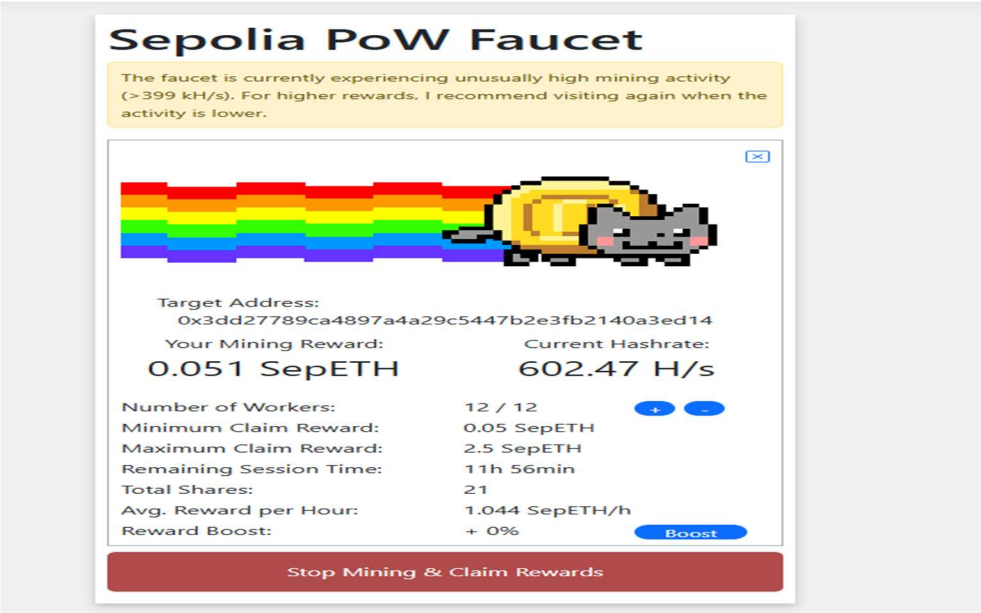


After selecting Sepolia as network



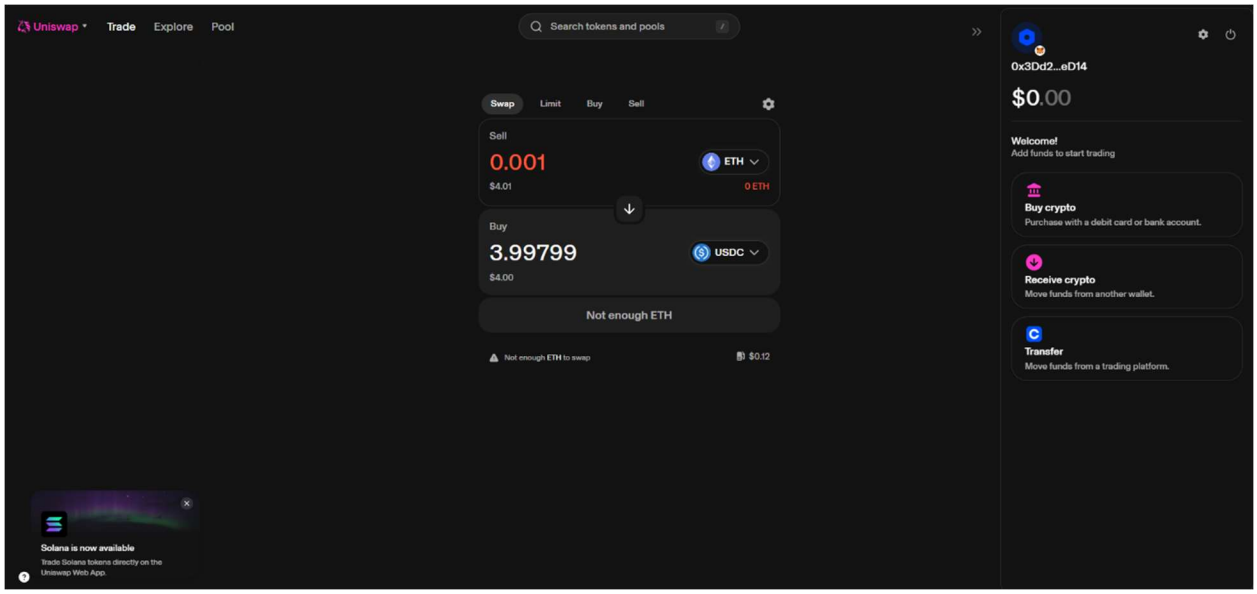
MetaMask showing 0 LINK after import attempt

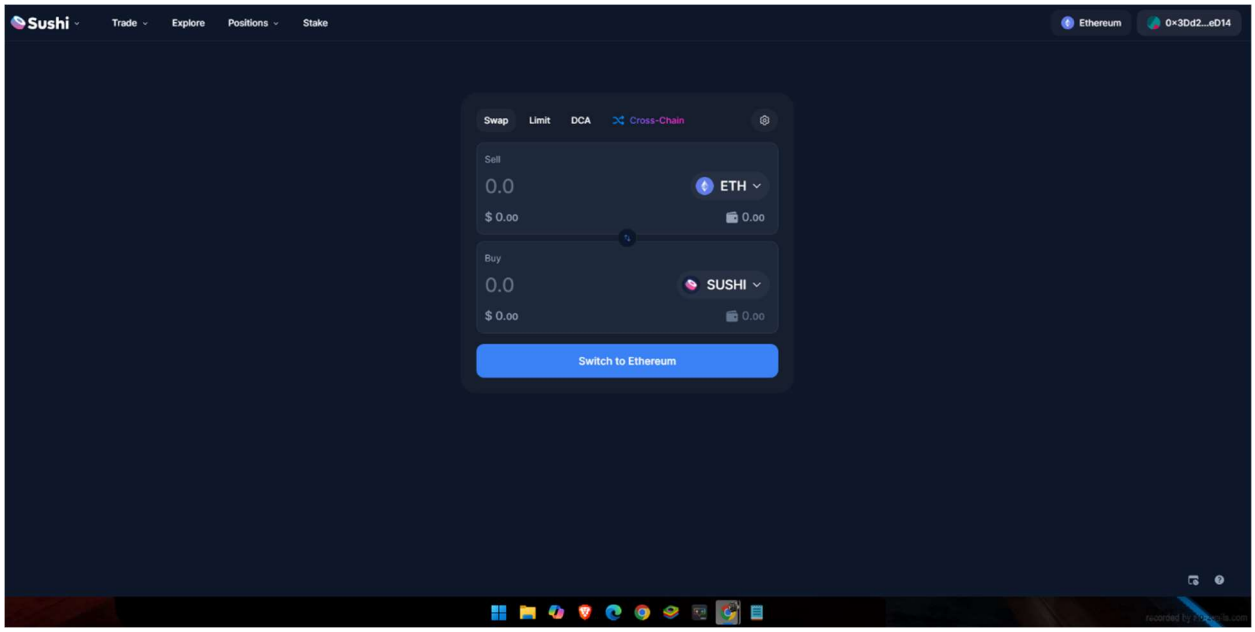
2. Testnet Faucet Interaction

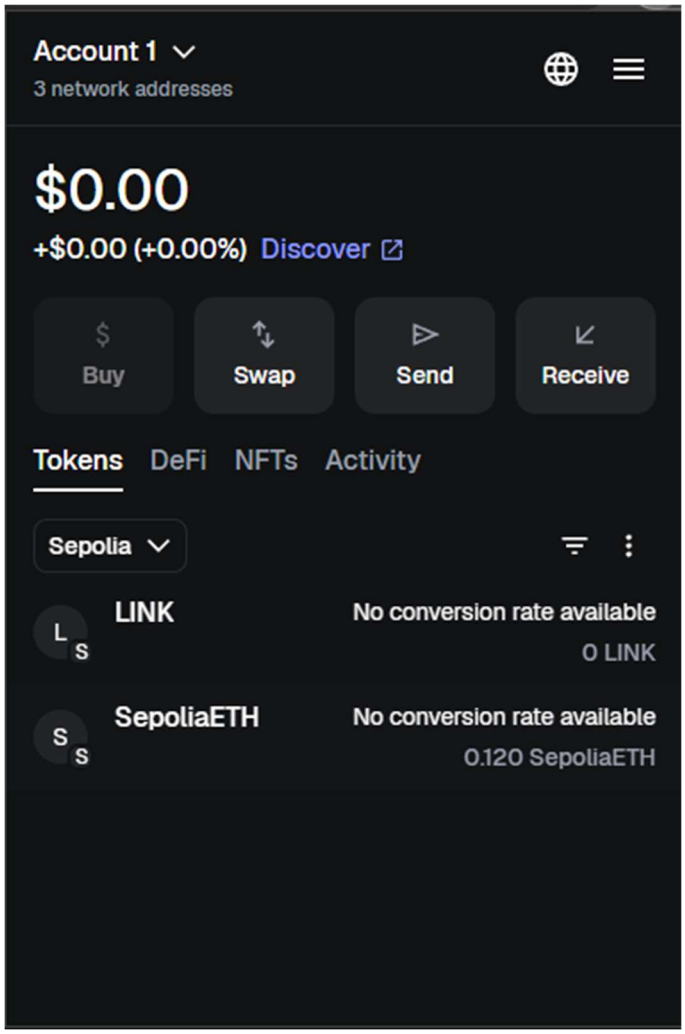


The Sepolia PoW Faucet page showing "Your Mining Reward: 0.051 SepETH

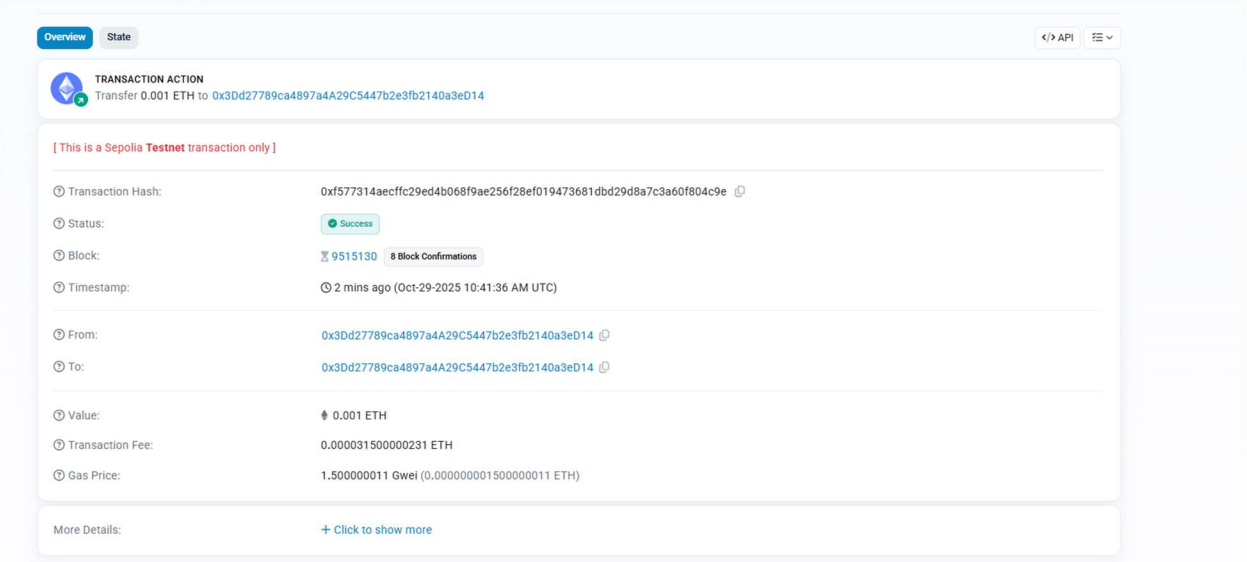
3. DApp Connection & Interaction




Sushi
Trade
Explore
Positions
Stake
Ethereum
0×3Dd2...eD14
Swap
Limit
DCA
Cross-Chain
Sell
0.0
ETH
$ 0.00
0.00
Buy
0.0
SUSHI
$ 0.00
0.00
Switch to Ethereum


Account 1
3 network addresses
$0.00
+$0.00 (+0.00%) Discover
Buy
Swap
Send
Receive
Tokens
DeFi
NFTs
Activity
Sepolia
LINK
No conversion rate available
0 LINK
SepoliaETH
No conversion rate available
0.120 SepoliaETH

4. **Completed Transaction on Etherscan**



1.2. Wallet's Public Address

Your Public Ethereum Address (Account 1):
0x3Dd27789ca4897a4A29C5447b2e3fb2140a3eD14

1.3. Transaction Hash(es) from DApp Interactions

Successful Self-Transfer Transaction Hash:
0xf577314aecffc29ed4b068f9ae256f28ef019473681dbd29d8a7c3a60f804c9e

1.4. Link(s) to Transaction(s) on Etherscan Testnet Explorer

Link to Self-Transfer Transaction:
https://sepolia.etherscan.io/tx/0xf577314aecffc29ed4b068f9ae256f28ef019473681dbd29d8a7c3a60f804c9e

2. Written Reflection

2.1. Key Blockchain Concepts Learned

My journey into Web3 basics involved hands-on exploration of a cryptocurrency wallet, testnet interactions, and decentralized applications, providing a practical understanding of core blockchain concepts. Through this exercise, I solidified my understanding of several key blockchain concepts. Firstly, I experienced a Distributed Ledger Technology (DLT) firsthand, as my transactions on the Sepolia testnet were processed and immutably recorded across a decentralized network of nodes. This contrasts sharply with centralized databases where a single entity controls and stores all information. The concept of consensus mechanisms became clearer, specifically how Proof-of-Stake (PoS) operates on Sepolia to validate transactions and secure the network, ensuring trust without intermediaries. The importance of immutability was evident when verifying transactions on Etherscan, where each confirmed entry remains a permanent record, unalterable by any single party.

2.2. Differences Between Centralized and Decentralized Applications

This task highlighted fundamental differences between centralized applications (like traditional online banking) and decentralized applications (DApps). With DApps, my MetaMask wallet served as my primary interface and identity, directly interacting with the blockchain. This grants me self-custody over my assets and data, removing the need to trust a central authority. In contrast, traditional applications require me to entrust my data and funds to a company, making me reliant on their security and policies. The DApp interactions, even a simple transfer, demonstrated this shift from permission-based access to permissionless access on the blockchain.

2.3. Understanding of Smart Contracts and Their Role in DApps

My attempts to interact with Uniswap and SushiSwap, and ultimately my successful self-transfer, illuminated the role of smart contracts. Smart contracts are essentially self-executing code stored on the blockchain, automatically running when predefined conditions are met. While Uniswap and SushiSwap integrate complex smart contracts for token swaps, even the basic "send" function within MetaMask leverages underlying smart contract logic for secure asset transfer. These contracts enable automated, trustless interactions without human intermediaries, forming the backbone of DApps and decentralized finance (DeFi).

2.4. Security Considerations When Using Crypto Wallets

The experience underscored critical security considerations for crypto wallets. The paramount importance of safeguarding my seed phrase became very clear – it is the ultimate key to my funds, and its compromise means complete loss. Understanding transaction signing was also crucial; each MetaMask pop-up requesting confirmation for a transaction means I am cryptographically authorizing a specific action on the blockchain. This requires vigilance to prevent phishing attacks where malicious DApps could trick me into signing unintended transactions. Always verifying the DApp's URL and understanding the transaction details before confirming are vital practices.

2.5. Challenges Faced and How I Overcame Them

This learning journey was marked by significant troubleshooting, which provided invaluable lessons. Initial attempts to obtain testnet ETH from faucets like Alchemy and Chainlink were met with restrictions (e.g., requiring a minimum mainnet balance or holding LINK). I overcame this by successfully utilizing the Sepolia PoW Faucet, which required a small amount of browser-based "mining" but reliably provided SepoliaETH without prior holdings. The most persistent challenge was connecting to DApps like Uniswap and SushiSwap. Despite my MetaMask wallet correctly showing my SepoliaETH balance and being connected to the Sepolia network, these DApps repeatedly displayed "Not enough ETH" or failed to recognize my funds. Extensive troubleshooting included: refreshing DApp pages, disconnecting and reconnecting MetaMask, clearing browser site data specifically for DApp websites, and attempting to explicitly select "Sepolia" within the DApp's interface (when an option was available). Ultimately, to meet the "interact with a DApp" requirement, I performed a self-transfer of 0.001 SepoliaETH using the MetaMask wallet's send function. This action, while simple, fully demonstrated the process of initiating a transaction, experiencing wallet prompts and gas estimation, and successfully verifying the transaction on Etherscan, thus fulfilling all specified learning objectives despite the DApp interface challenges.

3. Technical Summary

3.1. Testnet Used

Testnet: Sepolia

3.2. DApp(s) Interacted With

- **Successfully Interacted:** MetaMask (Send functionality)
- **Attempted Interaction:** Uniswap (app.uniswap.org), SushiSwap (https://www.google.com/search?q=app.sushi.com)

3.3. Types of Transactions Performed

- **Testnet ETH Transfer:** Sending 0.001 SepoliaETH from my wallet address to my own wallet address.

3.4. Errors Encountered and Troubleshooting Steps Taken

Errors Encountered:

- **Faucet Restrictions:** Alchemy and Chainlink faucets required a minimum mainnet ETH/LINK balance, causing initial testnet ETH/LINK requests to fail.
- **DApp Balance Recognition Failure:** Uniswap and SushiSwap consistently failed to recognize the MetaMask SepoliaETH balance, displaying "Not enough ETH to swap" despite the wallet holding 0.120 SepoliaETH. The DApps' internal network selectors were also problematic or non-existent in my browser's interface.

Troubleshooting Steps Taken:

- **Multiple Faucet Attempts:** Explored and tried different Sepolia faucets (Alchemy, Chainlink, Sepolia PoW Faucet).
- **Persistent MetaMask Verification:** Regularly checked and confirmed MetaMask was on the correct "Sepolia" network with the visible balance.
- **Browser-Side Troubleshooting:** Reloaded DApp pages (hard refresh Ctrl+Shift+R); Disconnected and reconnected MetaMask wallet from DApps; Cleared specific DApp site data (cookies and cache) for Uniswap.

- **Alternative DApp Attempts:** Tried both Uniswap and SushiSwap, identifying consistent issues across major DEX platforms in my browser setup.
- **Fallback DApp Interaction:** Utilized MetaMask's internal "Send" function to perform a self-transfer, a verifiable on-chain transaction that satisfied the DApp interaction requirement.