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EXPERIMRNT-02

AIM: Setup a Bitcoin wallet like Electrum and demonstrate sending and receiving Bitcoins on a testnet. Use Blockchain explorer to observe the transaction details

DESCRIPTION:

Electrum is one of the most popular and lightweight Bitcoin wallets available today. It is designed to provide users with a secure, efficient, and easy way to store, send, and receive Bitcoin. Below is a detailed description of Electrum, its features, and its advantages:

What is Electrum?

Electrum is an open-source Bitcoin wallet that was first released in 2011. It is focused on simplicity and speed, making it an excellent choice for both beginners and advanced Bitcoin users. Electrum uses a decentralized server network to access the Bitcoin blockchain, ensuring reliability and fast performance.

Key Features of Electrum

1. **Lightweight**:
   - Electrum does not download the entire Bitcoin blockchain. Instead, it connects to decentralized servers that provide blockchain data, saving time and storage space.
2. **Secure**:
   - Electrum is highly secure and provides features like two-factor authentication (2FA), multi-signature wallets, and hardware wallet support.
   - Your private keys are encrypted and never leave your computer.
3. **Open Source**:
   - The wallet's source code is publicly available, allowing anyone to audit or contribute to its development.
4. **Cross-Platform**:
   - Electrum is available for Windows, macOS, Linux, and Android.
5. **Customizable Fees**:
   - Users can adjust transaction fees based on urgency. Lower fees are suitable for slower confirmations, while higher fees ensure faster processing.

Procedure:

Step 1: Install Electrum

Electrum is a lightweight Bitcoin wallet. To use the testnet version, you'll need to install Electrum and configure it for testnet.

1. **Download Electrum**:
   - Visit the official Electrum website.
   - Download the latest version for your operating system (Windows, macOS, or Linux).
2. **Run Electrum in Testnet Mode**:
   - On Windows:
     - Open the **Command Prompt**, navigate to the directory where you installed Electrum, and run:

electrum --testnet

Step 2: Set Up a Testnet Wallet

1. **Create a New Wallet**:
   - Choose **"Create a new wallet"** and select **Standard Wallet**.
   - Write down the recovery seed phrase (important for backup).
   - Set a strong password for the wallet.
2. **Switch to Testnet**:

Step 3: Get Testnet Bitcoins

1. **Find a Testnet Faucet**:
   - Use a faucet to get free testnet BTC. Example:
     - https://bitcoinfaucet.uo1.net/
   - Enter your testnet Bitcoin address (you can copy it from Electrum under Receive) to request testnet BTC.
2. **Check Your Balance**:
   - Once the faucet sends the coins, you should see them in your wallet after a few minutes.

Step 4: Send Testnet Bitcoin

1. **Get a Receiver Address**:
   - Use another testnet wallet (or the Receive tab in Electrum on another device) to generate a receiving address.
2. **Send Transaction**:
   - Go to the Send tab in Electrum.
   - Enter the receiver's testnet Bitcoin address and the amount to send.
   - Set an appropriate transaction fee (Electrum will recommend one).
   - Click **Send** and confirm the transaction.
3. **Observe Transaction ID**:
   - Electrum will display the transaction ID after sending. Copy it for tracking.

Step 5: Use a Blockchain Explorer

1. **Open a Testnet Blockchain Explorer**:
   - Example: https://blockstream.info/testnet/
2. **Track the Transaction**:
   - Paste the transaction ID into the explorer's search bar to view details like:
     - Sender and receiver addresses.
     - Transaction amount.
     - Transaction fee.
     - Confirmation status.

Step 6: Receive Bitcoin

1. **Generate a Receiving Address**:
   - In Electrum, go to the Receive tab and copy your receiving address.
2. **Send Bitcoin to This Address**:
   - You can use another wallet or the faucet to send Bitcoin to your address.
3. **Check for Incoming Funds**:
   - Your wallet will show the incoming transaction and update the balance once it's confirmed.

Output:

Example Transactions:

Sending:

- **Transaction ID**: 4b1f35...
- **From Address**: tb1q...
- **To Address**: tb1q...
- **Amount**: 0.001 BTC
- **Fee**: 0.0001 BTC

Receiving:

- Check the testnet blockchain explorer to verify that the transaction has reached your address.