ERC-20 quickstart

In this quickstart tutorial we'll walk through how to deploy your first smart-contract to the Filecoin network.

We're going to install a browser-based wallet called MetaMask, create a new wallet address, supply some test currency to that wallet, and then use a browser-based development environment called Remix to deploy a smart contract to the Filecoin network. We're going to be creating an ERC-20 token in this quickstart. The ERC-20 contract is used a lot in representing a massive array of tokens across multiple blockchains, primarily the Ethereum blockchain.

If you're an Ethereum developer, check out theFEVM Hardhat kit .

Accounts and assets

We're going to be using MetaMask, a cryptocurrency wallet that lives in your browser making it very easy for users to interact with web3-based sites!

Create a wallet

Before we can interact with the Filecoin network, we need funds. But before we can get any funds, we need somewhere to put them!

1. Open your browser and visit theMetaMask website
2. .
3. Install the wallet by clicking theDownload for
4. button. MetaMask is available for Brave, Chrome, Edge, Firefox, and Opera.
5. Once you have installed MetaMask, it will open aGet started
6. window.
7. ?
8. ClickCreate a new wallet
9. .
10. Enter a password to secure your MetaMask wallet. You will need to enter this password every time you use the wallet.
11. ?
12. Follow the prompts until you get to theSecret Recovery Phrase
13. window. Read the information about what thisrecovery phrase
14. is on this page.
15. Eventually you should get to theWallet creation success
16. page!
17. ?
18. Once you've done that, you should have your account set up!
19. ?
20.

Switch networks

You may notice that we are currently connected to theEthereum Mainnet . We need to point MetaMask to the Filecoin network, specifically theCalibration testnet . We'll use a website calledchainlist.org to give MetaMask the information it needs quickly.

1. Go tochainlist.org
2. .
3. Enable theTestnets
4. toggle and enterFilecoin
5. into the search bar.
6. ?
7. Scroll down to find theFilecoin – Calibration
8. testnet
9. .
10. In MetaMask clickNext
11. .
12. ?
13. ClickConnect.
14. ClickApprove
15. when prompted toAllow this site to add a network.
16. ClickSwitch network
17. when prompted by MetaMask.
18. Open MetaMask from the browser extensions tab:
19. ?
20. You should see theFilecoin Calibration
21. testnet listed at the top.

22.

Nice! Now we've got the Filecoin Calibration testnet set up within MetaMask. You'll notice that our MetaMask window shows0 TFIL . Test-filecoin (TFIL) isFIL that has no value in thereal world , and developers use it for testing. We'll grab someTFIL next.

Get some funds

1. In your browser, open MetaMask and copy your address to your clipboard:
2. ?
3. Go tofaucet.calibration.chainsafe-fil.io
4. and clickSend Funds.
5. Paste your address into the address field, and clickSend Funds
6. .
7. The faucet will show a transaction ID. You can copy this ID into a Calibration testnetblock explorer
8. to view your transaction. After a couple of minutes, you should see sometFIL
9. transferred to your address.
10.

That's all there is to it! GettingtFil is easy!

Contract creation

The development environment we're going to be using is called Remix, viewable atremix.ethereum.org . Remix is an incredibly sophisticated tool, and there's a lot you can play around with! In this tutorial however, we're going to stick to the very basics. If you want to learn more, check outthe Remix documentation .

Create a workspace

In Remix, workspaces are where you can create a contract, or group of contracts, for each project. Let's create a new workspace to create our new ERC-20 token.

1. Openremix.ethereum.org
2. .
3. Open the dropdown menu and clickcreate a new workspace
4. .
5. ?
6. In theChoose a template
7. dropdown, selectERC20
8. .
9. UnderCustomize template
10. Features
11. , check theMintable
12. box.
13. Enter a fun name for your token in theWorkspace name
14. field. Something likeCorgiCoin
15. works fine.
16. ClickOK
17. to create your new workspace.
18. ?
19.

Customize the contract

The contract template we're using is pretty simple. We just need to modify a couple of variables.

1. Click the compiler icon to open the compiler panel. Update the compiler version by selecting0.8.20
2. from the compiler dropdown.
3. ?
4. Under thecontract
5. directory, clickMyToken.sol
6. .
7. ?
8. In the editor panel, replaceMyToken
9. with whatever you'd like to name your token. In this example, we'll useCorgiCoin
10. .
11. ?
12. On the same line, replace the second string with whatever you want the symbol of your token to be. In this example,

we'll useCRG
13. .
14. ?
15.

That's all we need to change within this contract. You can see on line 4 that this contract is importing another contract from@openzeppelin for us, meaning that we can keep our custom token contract simple.

Compile

1. Click the green play symbol at the top of the workspace to compile your contract. You can also pressCMD
2. +s
3. on MacOS orCTRL
4. +s
5. on Linux and Windows.
6. ?
7. Remix automatically fetches the threeimport
8. contracts from the top of our.sol
9. contract. You can see these imported contracts under the.deps
10. directory. You can browse the contracts there, but Remix will not save any changes you make.
11. ?
12.

Deploy

Now that we've successfully compiled our contract, we need to deploy it somewhere! This is where our previous MetaMask setup comes into play.

1. Click theDeploy
2. tab from the left.
3. ?
4. Under theEnvironment
5. dropdown, selectInjected Provider - MetaMask
6. .
7. ?
8. MetaMask will open a new window confirming that you want to connect your account to Remix.
9. ClickNext
10. :
11. ?
12. ClickConnect
13. to connect yourtFIL
14. account to Remix.
15. ?
16. Back in Remix, under theAccount
17. field, you'll see that it says something like0x11F... (5 ether)
18. . This value is 5tFIL
19. , but Remix doesn't support the Filecoin network so doesn't understand whattFIL
20. is. This isn't a problem, it's just a little quirk of using Remix.
21. ?
22. Under theContract
23. dropdown, ensure the contract you created is selected.
24. ?
25. Gather your MetaMask account address and populate the deploy field in Remix.
26. ?
27. ?
28. ClickDeploy
29. .
30. ?
31. MetaMask will open a window and as you to confirm the transaction. Scroll down and clickConfirm
32. to have MetaMask deploy the contract.
33. Back in Remix, a message at the bottom of the screen shows that the creation of your token is pending.
34. ?
35. Wait around 90 seconds for the deployment to complete.
36. ?
37.

On the Filecoin network, a new set of blocks, also called a tipset, is created every thirty seconds. When deploying a contract, the transaction needs to be received by the network, and then the network needs to confirm the contract. This process takes around one to two tipsets to process – or around 60 to 90 seconds.

Use your contract

Now that we've compiled and deployed the contract, it's time to actually interact with it!

Mint your tokens

Let's call a method within the deployed contract to mint some tokens.

1. Back in Remix, open theDeployed Contracts
2. dropdown, within theDeploy
3. sidebar tab.
4. ?
5. Expand themint
6. method. You must fill in two fields here:to
7. andamount
8. .
9. ?
10. Theto
11. field specifies where address you want these initial tokens sent to. Open MetaMask, copy your address, and paste it into this field.
12. ?
13. This field expects anattoFil
14. value. 1FIL
15. is equal to 1,000,000,000,000,000,000attoFil
16. . So if you wanted to mint 100FIL
17. , you would enter100
18. followed by 18 zeros:100000000000000000000
19. .
20. ClickTransact
21. .
22. ?
23. MetaMask will open a window and ask you to confirm the transaction:
24. ?
25.

Again, you must wait for the network to process the transaction, which should take about 90 seconds. You can move on to the next section while you're waiting.

Add to MetaMask

Currently, MetaMask has no idea what our token is or what it even does. We can fix this by explicitly telling MetaMask the address of our contract.

1. Go back to Remix and open theDeploy
2. sidebar tab.
3. UnderDeployed Contracts
4. , you should see your contract address at the top. Click the copy icon to copy the address to your clipboard:
5. ?
6. Open MetaMask, selectAssets
7. , and clickImport your tokens
8. :
9. ?
10. In theToken contract address
11. field, paste the contract address you just copied from Remix and then clickAdd custom token
12. . MetaMask should autofill the rest of the information based on what it can find from the Filecoin network.
13. ?
14. ClickImport token
15. :
16. You should now be able to see that you have 100 of your tokens within your MetaMask wallet!
17. ?
18.

Share your tokens

Having a bunch of tokens in your personal MetaMask is nice, but why not send some tokens to a friend? Your friend needs to create a wallet in MetaMask as we did in theCreate a wallet andSwitch networks sections. They will also need to import your contract deployment address like you did in theAdd your tokens to MetaMask section. Remember, you need to pay gas for every transaction that you make! If your friend tries to send some of your tokens to someone else but can't, it might be because they don't have anytFil .

Previous Filecoin EVM runtime Next Roadmap

Last updated5 days ago