

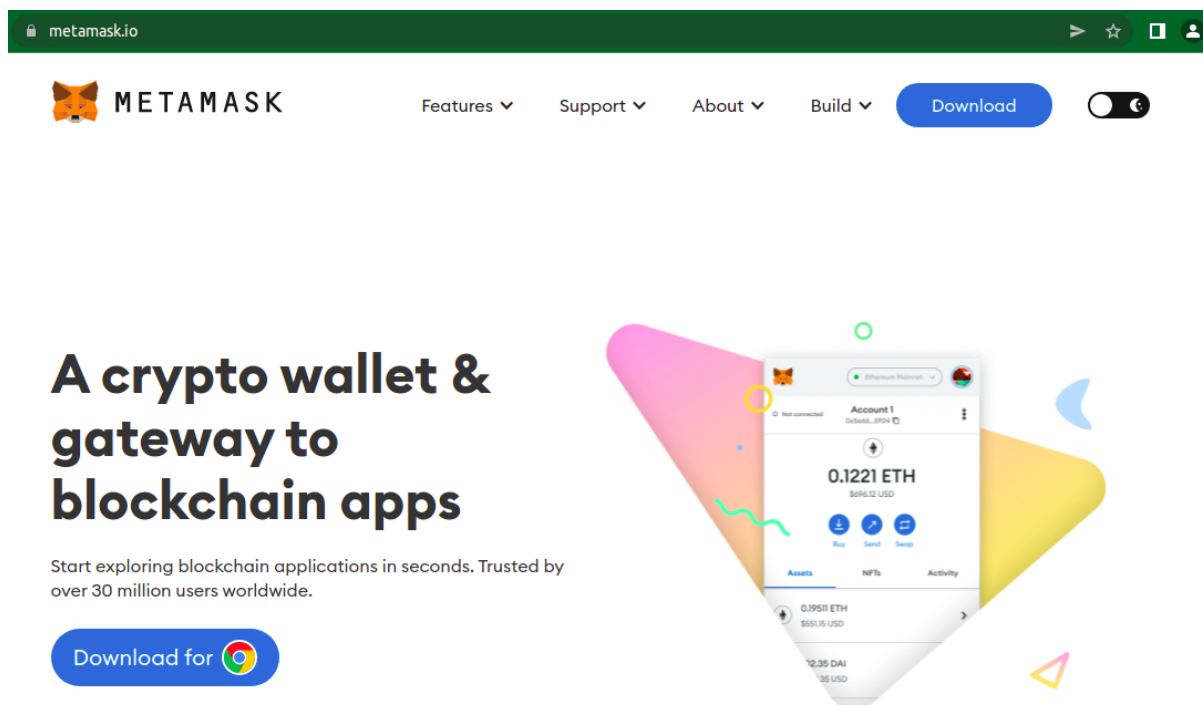


K B A

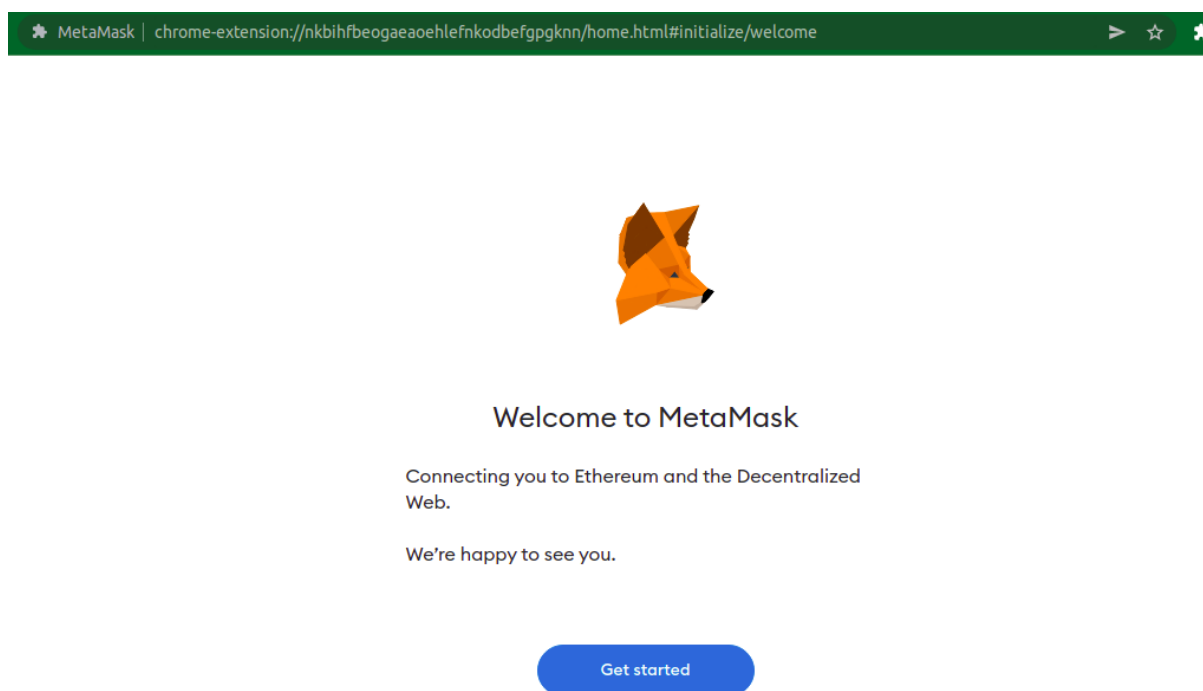
Lab Manual: Metamask & Remix IDE

Metamask Wallet

Go to <https://metamask.io/>



And get the browser extension from **download option**.





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After the browser extension gets added to your browser you will be greeted with this window click **get started**.

MetaMask | chrome-extension://nkbihfbeogaeaoehlefnkodbefgpgknn/home.html#initialize/metametrics-opt-in



METAMASK



Help us improve MetaMask

MetaMask would like to gather usage data to better understand how our users interact with the extension. This data will be used to continually improve the usability and user experience of our product and the Ethereum ecosystem.

MetaMask will..

- ✓ Always allow you to opt-out via Settings
- ✓ Send anonymized click & pageview events

- ✗ **Never** collect keys, addresses, transactions, balances, hashes, or any personal information
- ✗ **Never** collect your full IP address
- ✗ **Never** sell data for profit. Ever!

No thanks

I agree

This data is aggregated and is therefore anonymous for the purposes of General Data Protection Regulation (EU) 2016/679. For more information in relation to our privacy practices, please see our [Privacy policy here](#).

Continue with **I AGREE** option

MetaMask | chrome-extension://nkbihfbeogaeaoehlefnkodbefgpgknn/home.html#initialize/select-action



METAMASK

New to MetaMask?



No, I already have a Secret Recovery Phrase

Import your existing wallet using a Secret Recovery Phrase

Import wallet



Yes, let's get set up!

This will create a new wallet and Secret Recovery Phrase

Create a wallet



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If you have wallet then you can import your existing wallet with 12 word seed phrase, else you can continue with **create wallet** option

MetaMask | chrome-extension://nkbihfbeogaeaoehlefnkodbefgpgknn/home.html#initialize/create-password



Create password

New password (8 characters min)

Confirm password



I have read and agree to the [Terms of use](#)

Create

Enter the password for MetaMask

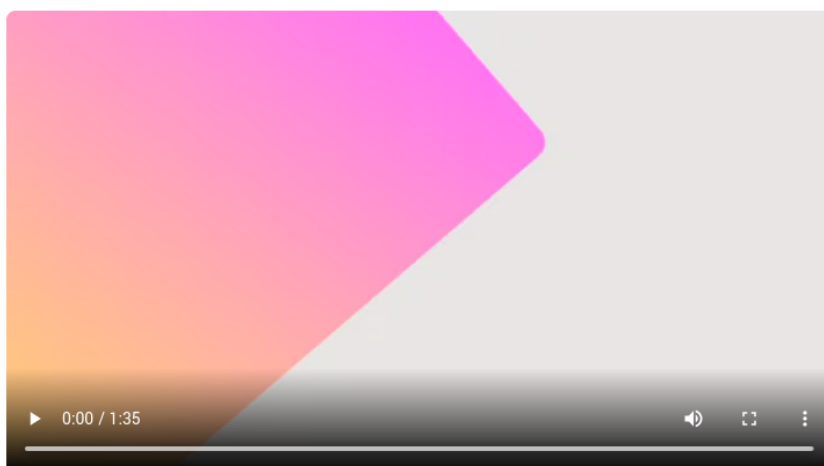
Next you will be shown the secret backup Phrase, aka Seed Word. If you ever forget the password of the MetaMask you can use the seed word to reset password and recover your accounts. Click on **Next**

MetaMask | chrome-extension://nkbihfbeogaeaoehlefnkodbefgpgknn/home.html#initialize/seed-phrase-intro



Secure your wallet

Before getting started, watch this short video to learn about your Secret Recovery Phrase and how to keep your wallet safe.



Next

What is a Secret Recovery Phrase?

Your Secret Recovery Phrase is a 12-word phrase that is the "master key" to your wallet and your funds

How do I save my Secret Recovery Phrase?

- Save in a password manager
- Store in a bank vault
- Store in a safe deposit box
- Write down and store in multiple secret places

Should I share my Secret Recovery Phrase?

Never, ever share your Secret Recovery Phrase, not even with MetaMask!

If someone asks for your recovery phrase they are likely trying to scam you and steal your wallet funds.



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Click on the ***Click Here to Reveal Secret Words*** to see the seed word.

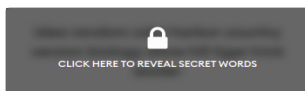


< Back

Secret Recovery Phrase

Your Secret Recovery Phrase makes it easy to back up and restore your account.

WARNING: Never disclose your Secret Recovery Phrase. Anyone with this phrase can take your Ether forever.



Remind me later

Next

Tips:

Store this phrase in a password manager like IPassword.

Write this phrase on a piece of paper and store in a secure location. If you want even more security, write it down on multiple pieces of paper and store each in 2 - 3 different locations.

Memorize this phrase.

[Download this Secret Recovery Phrase and keep it stored safely on an external encrypted hard drive or storage medium.](#)



< Back

Secret Recovery Phrase

Your Secret Recovery Phrase makes it easy to back up and restore your account.

WARNING: Never disclose your Secret Recovery Phrase. Anyone with this phrase can take your Ether forever.

idea random odor harbor country
version biology allow hill tiger trick
leader

Remind me later

Next

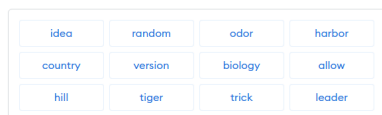
The MetaMask will ask you to confirm the seed phrase, select the buttons(with words of seed phrase written) in correct order and reproduce the seed word.



< Back

Confirm your Secret Recovery Phrase

Please select each phrase in order to make sure it is correct.



Confirm

To delete a word, click on the button again. After finishing click ***confirm***.



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Congratulations

You passed the test - keep your Secret Recovery Phrase safe, it's your responsibility!

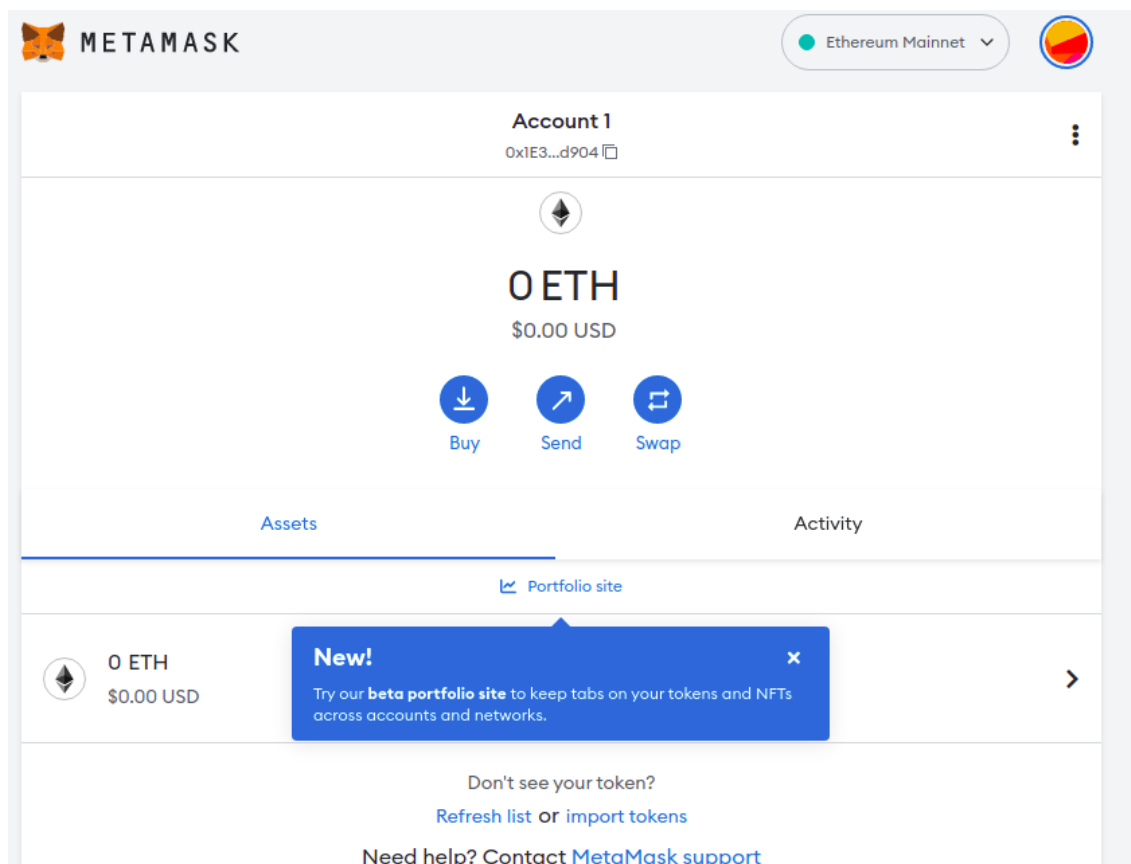
Tips on storing it safely

- Save a backup in multiple places.
- Never share the phrase with anyone.
- Be careful of phishing! MetaMask will never spontaneously ask for your Secret Recovery Phrase.
- If you need to back up your Secret Recovery Phrase again, you can find it in Settings > Security.
- If you ever have questions or see something fishy, contact our support [here](#).

*MetaMask cannot recover your Secret Recovery Phrase. [Learn more](#).

All done

Continue with **ALL DONE**.



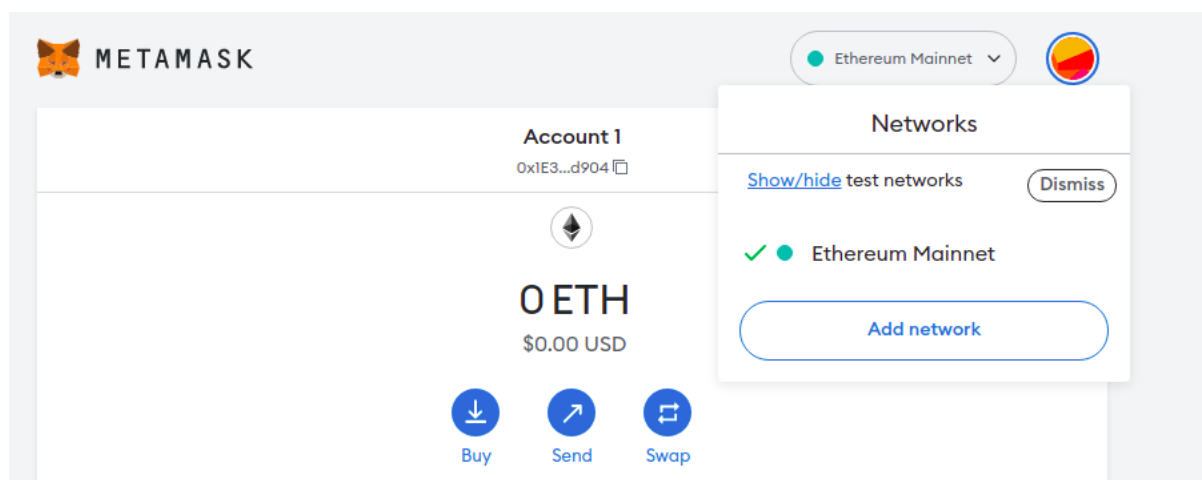
This is your MetaMask home screen, which will show the current selected account information.



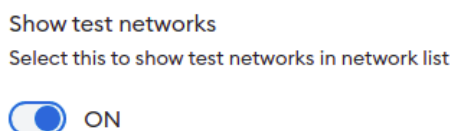
K B A

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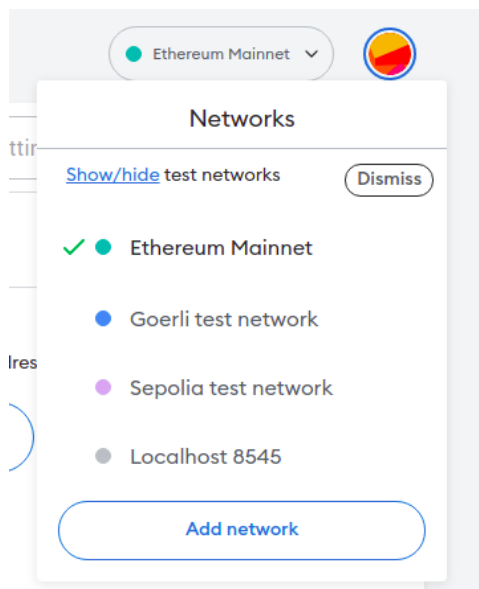
Click on the Main Ethereum Network which will open this menu. Using MetaMask you can seamlessly manage accounts on Main Ethereum Network or any test network.



Now click on **Show/Hide test networks** and enable test networks. Save the changes.



Now you will be able to see test networks also.



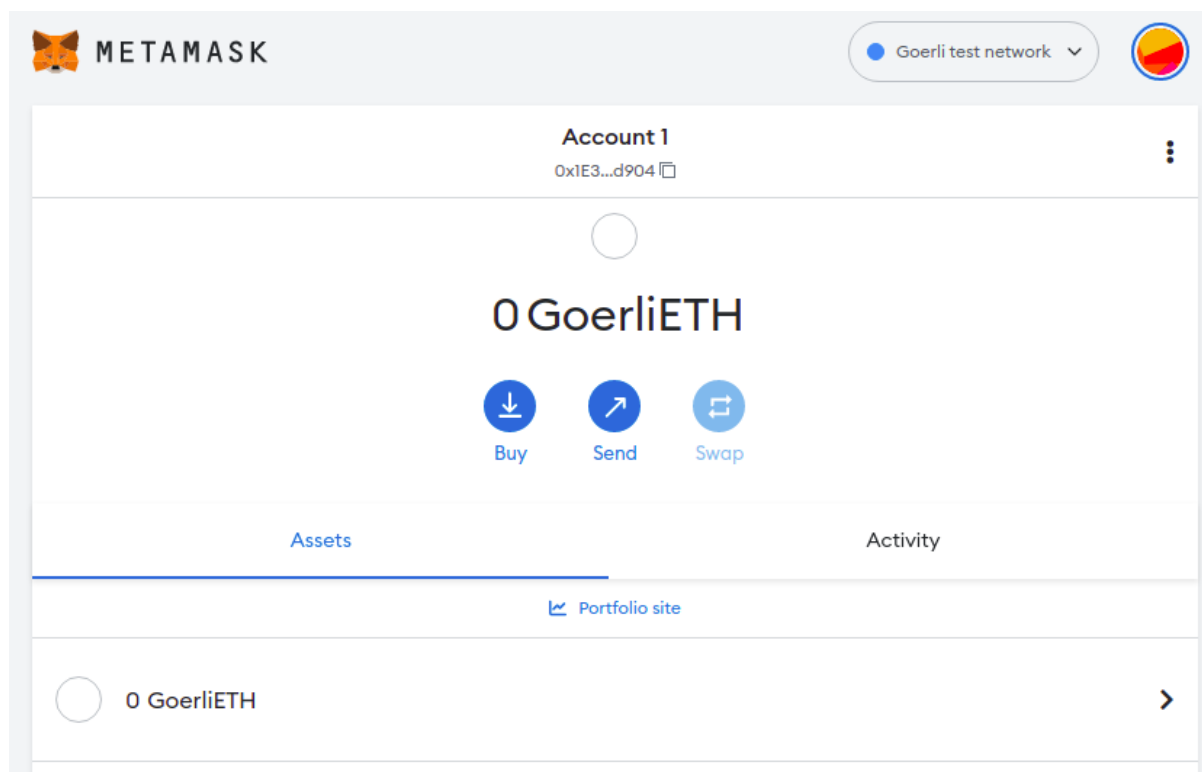
Now let's select the **Goerli Test Network** to check out all the features offered by MetaMask



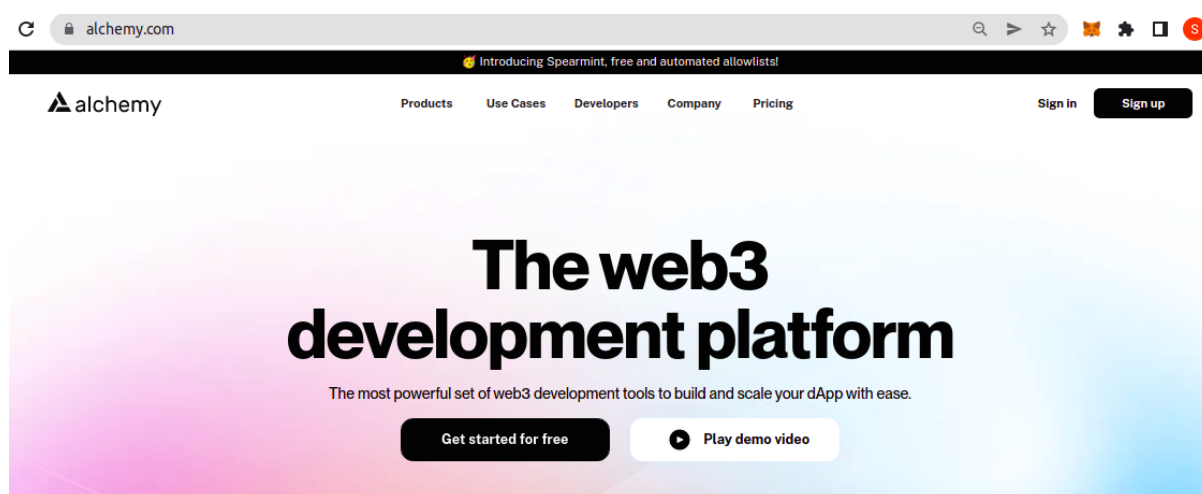
K B A

Lab Manual: Metamask & Remix IDE

As you can see now it has changed to Goerli Test Network and now let's get some test ether to play around with 😊.



Faucets are places which provide test ether. Many faucets are available. Each faucet will have its own way for restricting test ether requests. Let us try to get some from <https://goerlifaucet.com/>. It requires the user to signup using alchemy account. If you do not have an Alchemy account, you may visit <https://www.alchemy.com/> and create an account.

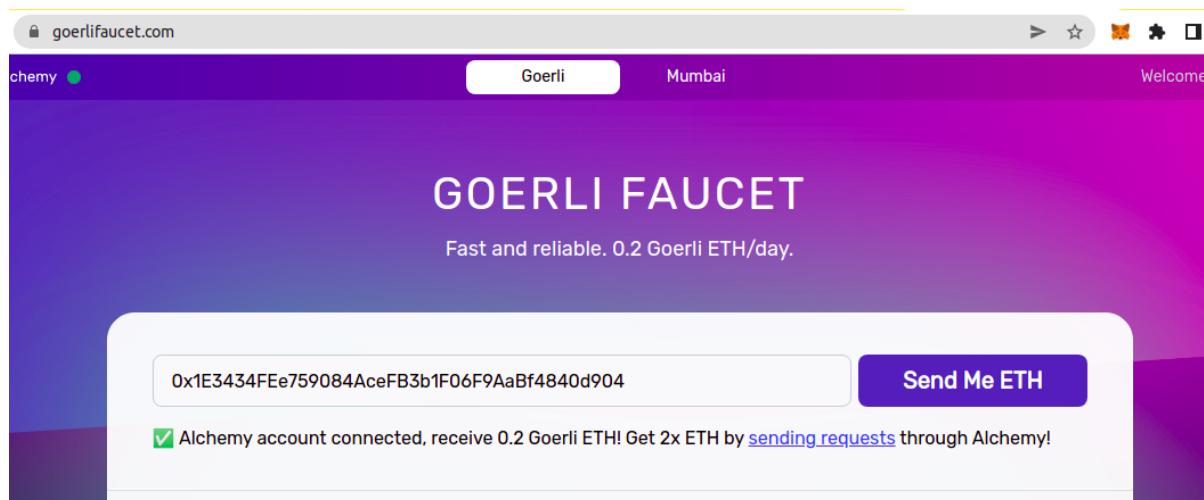




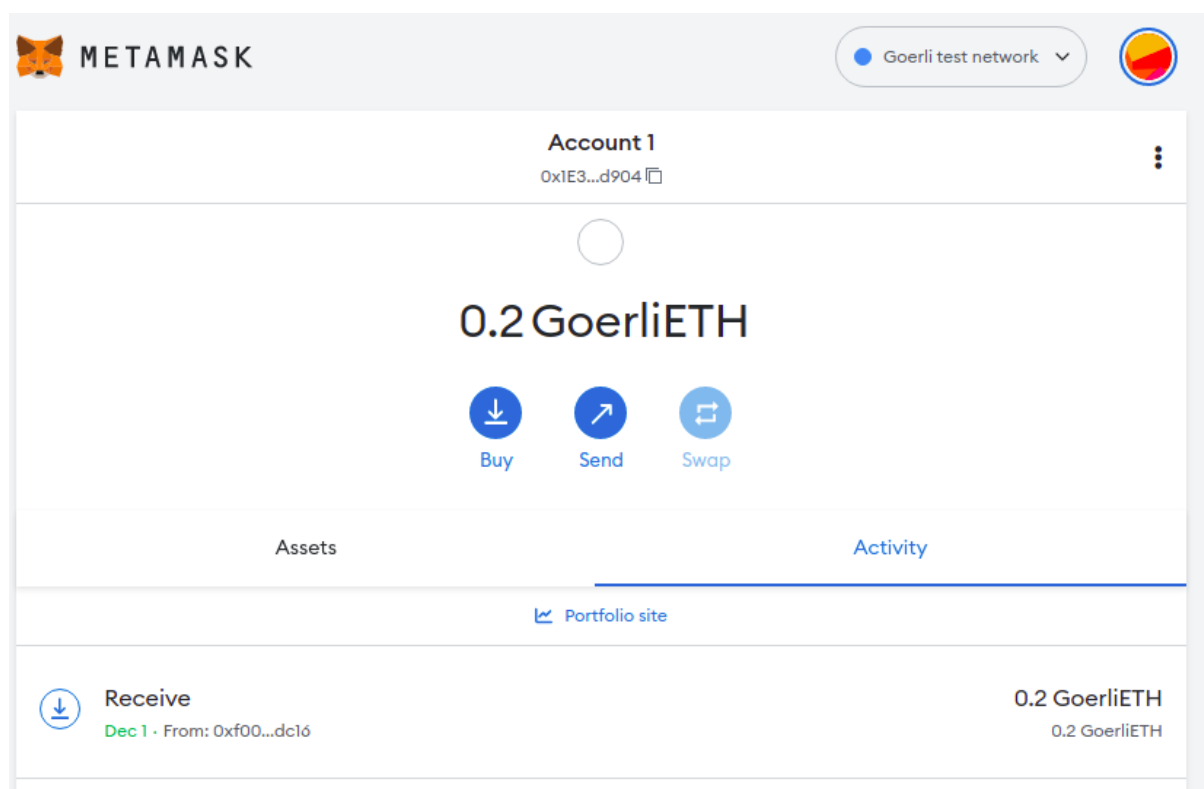
K B A

Lab Manual: Metamask & Remix IDE

Now go to <https://goerlifaucet.com/>, signin using the alchemy account. Paste your account address from MetaMask and click on **Send Me ETH**.



Once this operation is completed, your account will be credited with test ether.



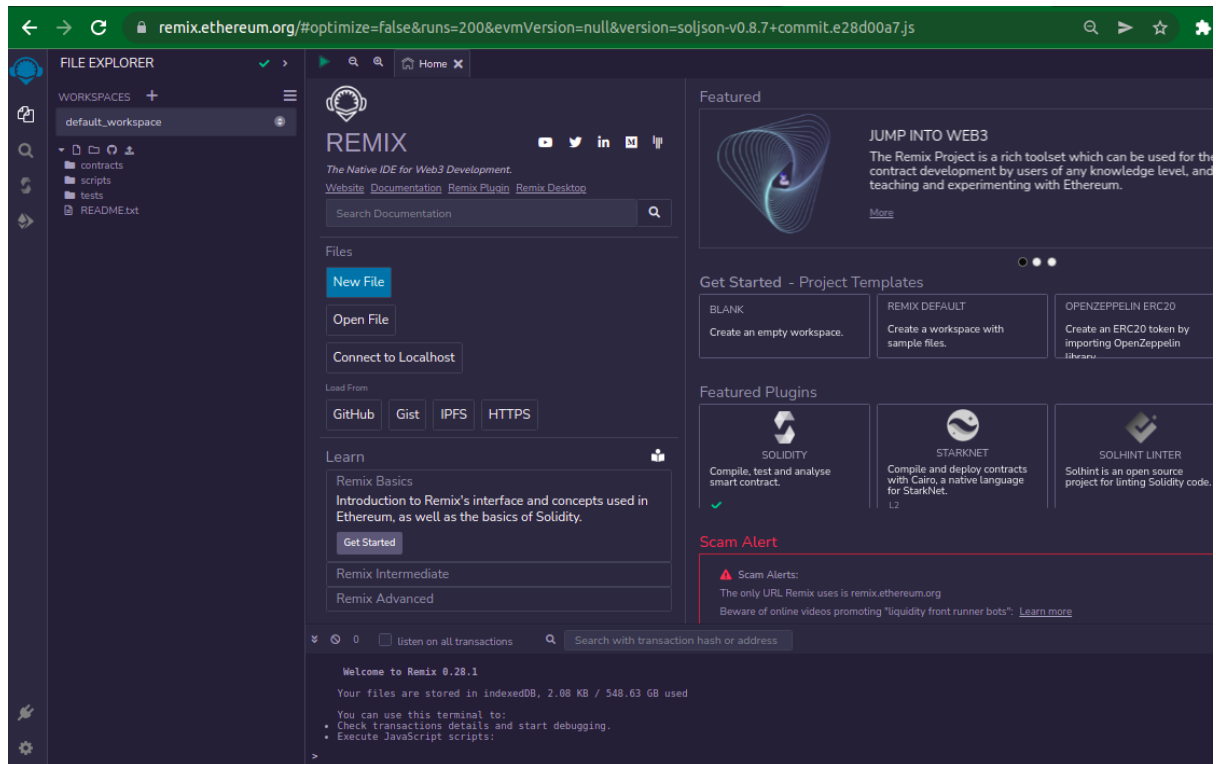
Under the **Activity tab**, you will be able to see the transaction details.



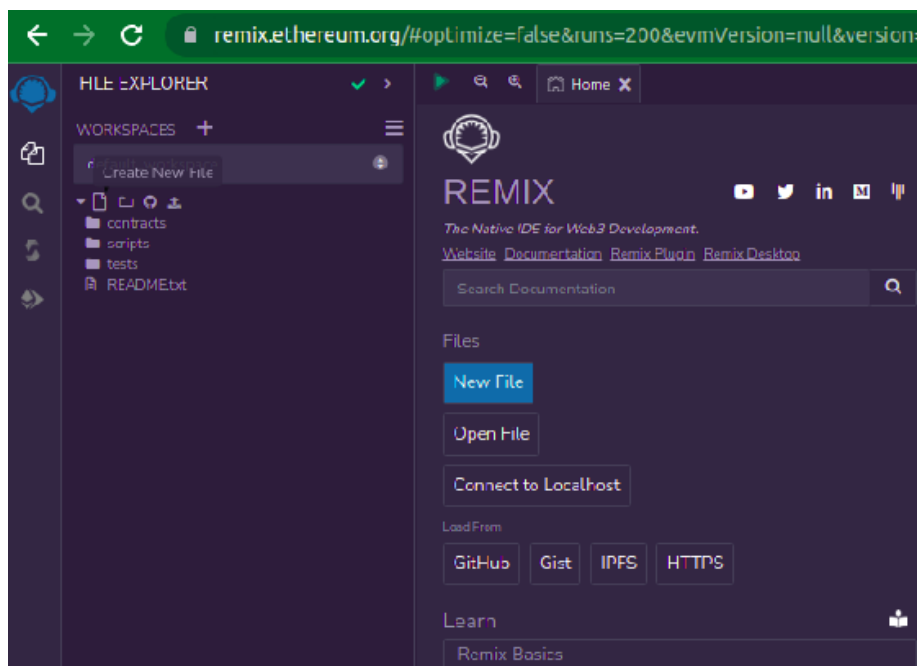
Lab Manual: Metamask & Remix IDE

Remix IDE

Remix IDE is available as a desktop application and also an online tool to write and test smart contracts. Go to <https://remix.ethereum.org/>



On the left, under workspaces, click on icon to **create a new file**. Name it *MyContract.sol*





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Copy and paste the below smart contract code into MyContract.sol

```
// SPDX-License-Identifier: MIT

pragma solidity 0.8.17;

contract MyContract{

    string message = "Hello Ethereum";

    function setMessage(string memory _message) public{

        message=_message;

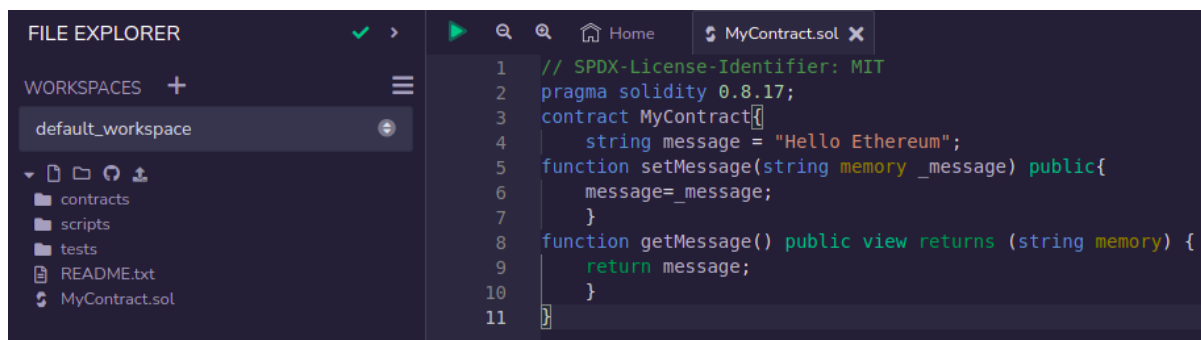
    }

    function getMessage() public view returns (string memory) {

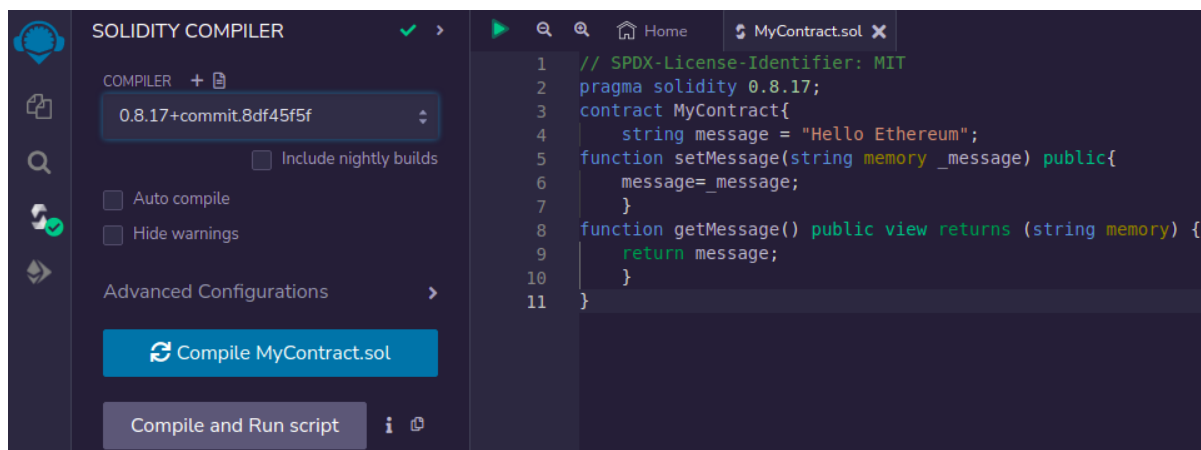
        return message;

    }

}
```



Go to Solidity compiler and select the version as 0.8.17, since our smart contract uses that version.



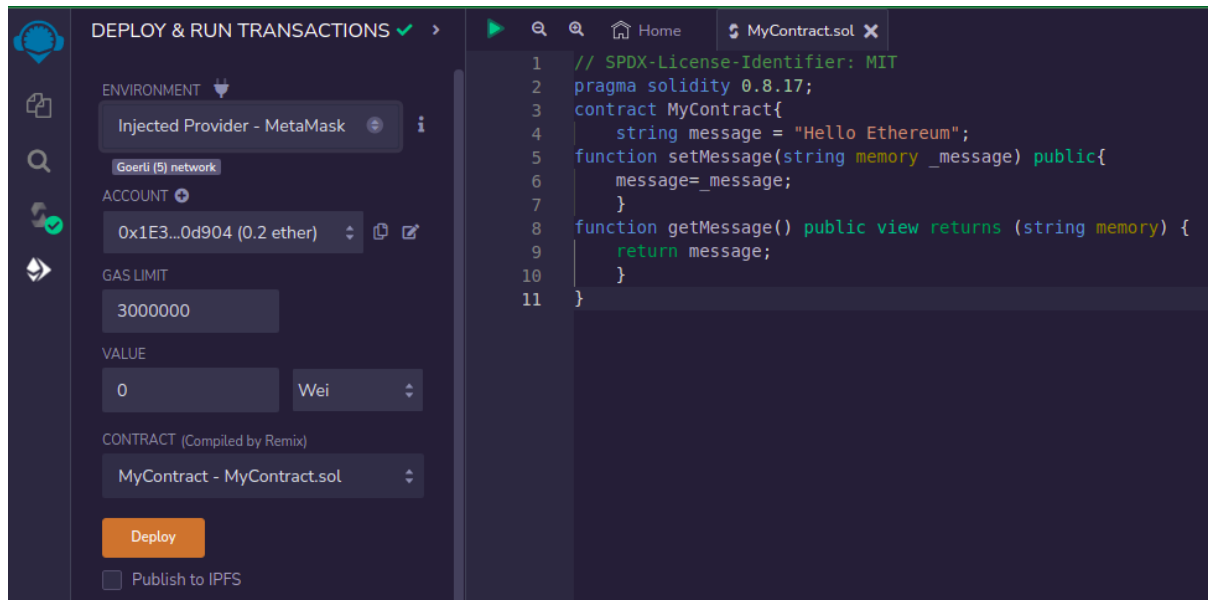
Save and click on **Compile MyContract.sol**. Make sure you get a green tick on compiler icon.



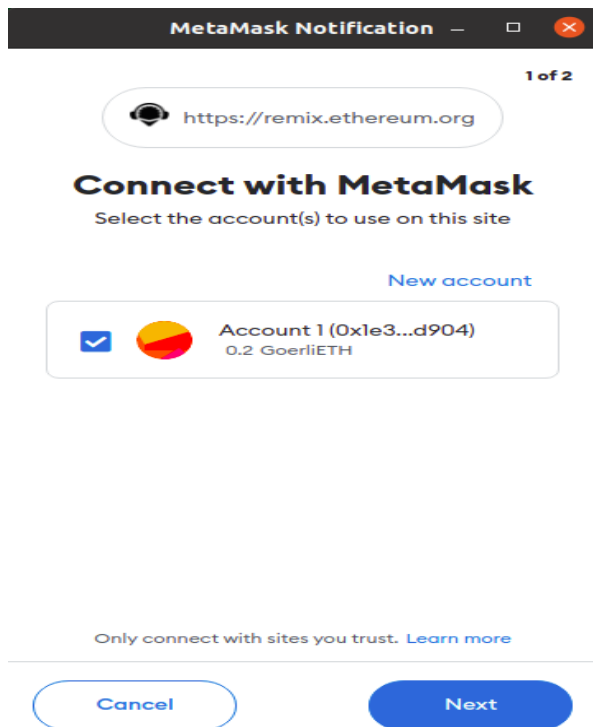
Lab Manual: Metamask & Remix IDE

Deploying Smart Contract using Metamask

Click on deploy and run transactions tab. Select the environment as Injected Provider-Metamask.



Metamask will give a notification to confirm connection with RemixIDE. Click on **Next**.



Once connection is established, Metamask accounts will be listed in the Remix IDE.

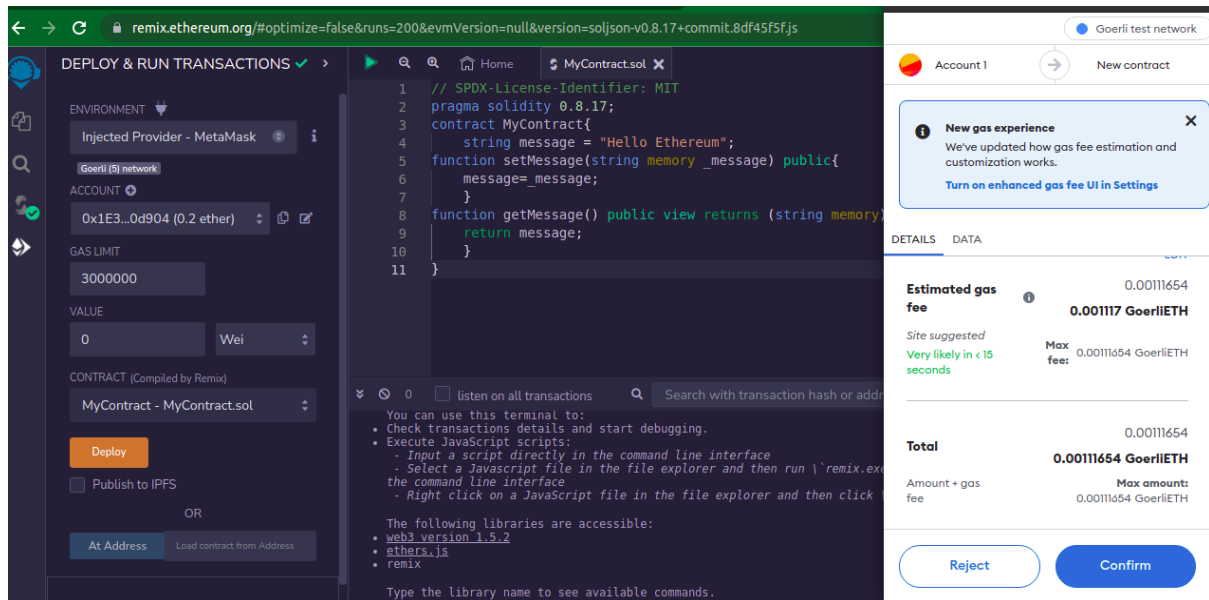


K B A

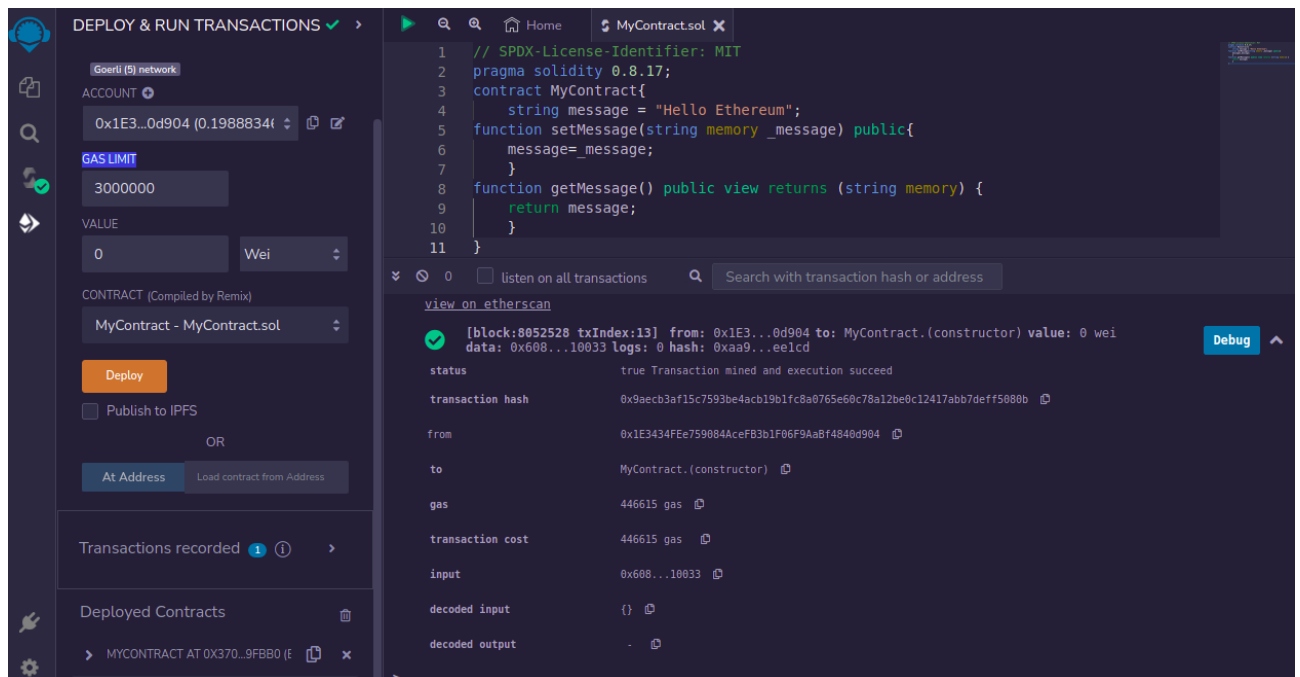
Lab Manual: Metamask & Remix IDE

Deploying Smart Contract

Click on **Deploy**. Metamask popup will ask for transaction confirmation. Click on **confirm**



After few seconds, transaction will be committed to the Goerli blockchain and you will get a popup confirmation. The details will be available in the terminal below the editor also.



On the terminal below the editor, click on the arrow next to Debug button. It will expand the transaction details. On the left pane, under Deployed Contracts, an instance of the contract will be available.

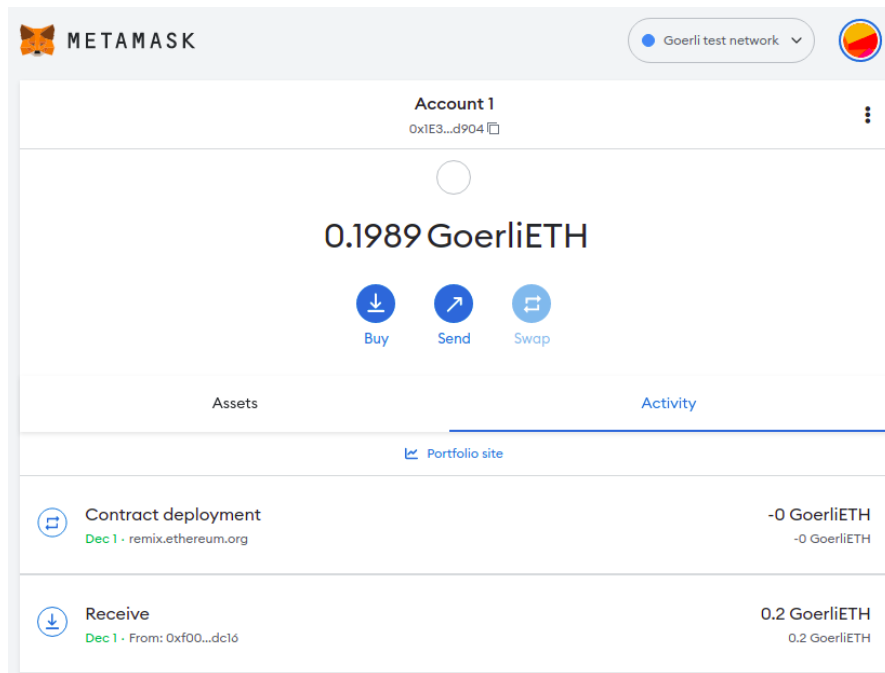


K B A

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Viewing transaction details on Etherscan

Transaction details can be viewed either by clicking on view on etherscan option in the terminal, or browsing the transaction history in metamask.



Click on **contract deployment** transaction to see its details.

Contract deployment

Status [View on block explorer](#)

Confirmed [Copy transaction ID](#)

From To

0x1E3...d904 New contract

Transaction

Nonce	0
Amount	-0 GoerliETH
Gas Limit (Units)	446615
Gas Used (Units)	446615
Base fee (GWEI)	0.000000019
Priority fee (GWEI)	2.5
Total gas fee	0.001117 GoerliETH
Max fee per gas	0.000000003 GoerliETH
Total	0.00111654 GoerliETH

Click on **view on block explorer**. The etherscan page displaying the transaction details will be displayed in the browser.



K B A

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goerli.etherscan.io/tx/0x9aecb3af15c7593be4acb19b1fc8a0765e60c78a12be0c12417abb7deff5080b

Etherscan

Goerli Testnet Network

All Filters

Search by Address / Txn Hash

Home

Transaction Details

Overview

State

[This is a Goerli **Testnet** transaction only]

Transaction Hash:

0x9aecb3af15c7593be4acb19b1fc8a0765e60c78a12be0c12417abb7deff5080b

Status:

Success

Block:

8052528

212 Block Confirmations

Timestamp:

49 mins ago (Dec-01-2022 05:33:12 AM +UTC)

From:

0x1e3434fee759084acefb3b1f06f9aabb4840d904

To:

[Contract 0x370c673bec5ca6bf0932130f5bb0ac959fe9fbb0 Created]

Value:

0 Ether (\$0.00)

Transaction Fee:

0.001116537508485685 Ether (\$0.00)

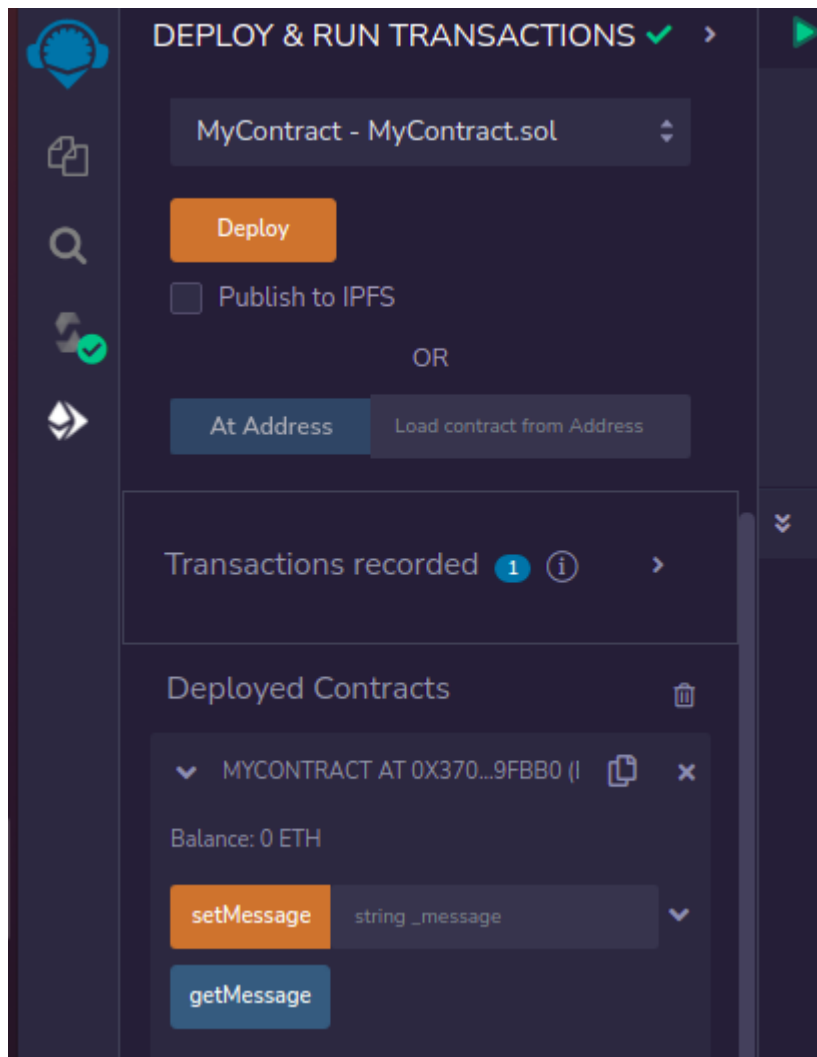


K B A

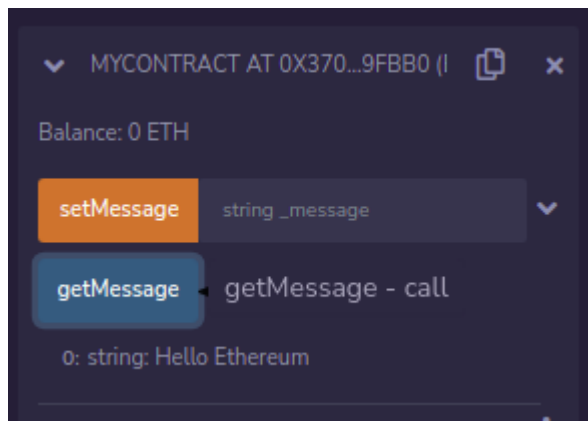
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Interact with Smart Contract in Remix IDE

Expand the MyContract instance under Deployed Contracts



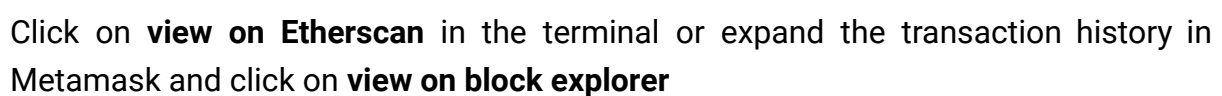
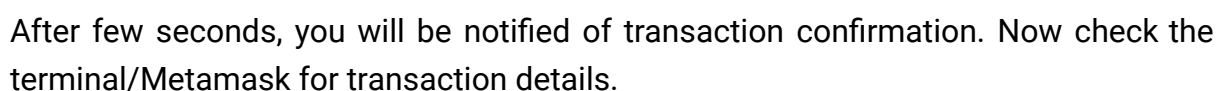
Click on the **getMessage** button.



The value of message will be displayed below the button



Enter text next to the setMessage button and click on **setMessage** button.





K B A

Lab Manual: Metamask & Remix IDE

In the etherscan page, check the field **input data**. Use the **decode** option to view the parameters.

The screenshot shows the Etherscan transaction page for a Goerli testnet transaction. The URL is `goerli.etherbase.io/tx/0xe553d665dfae58eaca0565d506cb22b5548a3d9105f81ad06b32a9772798c3bf`. The transaction is successful, with 13 block confirmations. The input data section shows a single parameter: `_message` of type `string` with the value `KBA`.

#	Name	Type	Data
0	_message	string	KBA

Now the value of message is set to KBA. Try to call the **getMessage** function again to confirm the change.

The screenshot shows the Remix IDE interface. The `setMessage` function is called with the argument `KBA`. The `getMessage` function is then called, and the output shows `0: string: KBA`.

Note: The `setMessage` function alters the value of a state variable. Hence it is a transaction which has an associated gas cost, as mentioned in the Metamask notification. The `getMessage` function reads from the blockchain state. Since it does not alter the state, it is a call operation which does not have any transaction cost.

Read more about [MetaMask](#), [Smart Contracts](#), [Interacting with Smart Contract](#) and [Converting smart contract to DApp](#)

**Learn More at**

- KBA blogs: <https://kbaiitmk.medium.com/>
- Blockchain Certification Courses (Free/Paid): <https://learn.kba.ai/>
- Video Tutorials/Session Recordings/Bootcamps:
<https://www.youtube.com/@KeralaBlockchainAcademy>
- LinkedIn
 - Profile: <https://www.linkedin.com/in/kerala-blockchain-academy/>
 - Community: <https://www.linkedin.com/groups/13861449/>