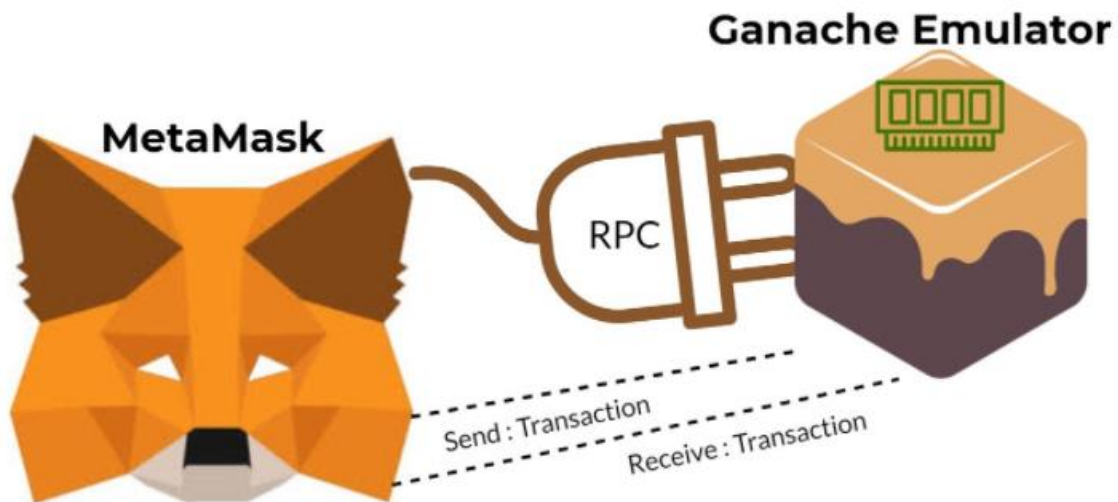


Simulating Ethereum Blockchain



Ganache is a personal Ethereum blockchain which you can use to run tests, execute commands, and inspect state while controlling how the chain operates

Download at: <https://www.trufflesuite.com/ganache>

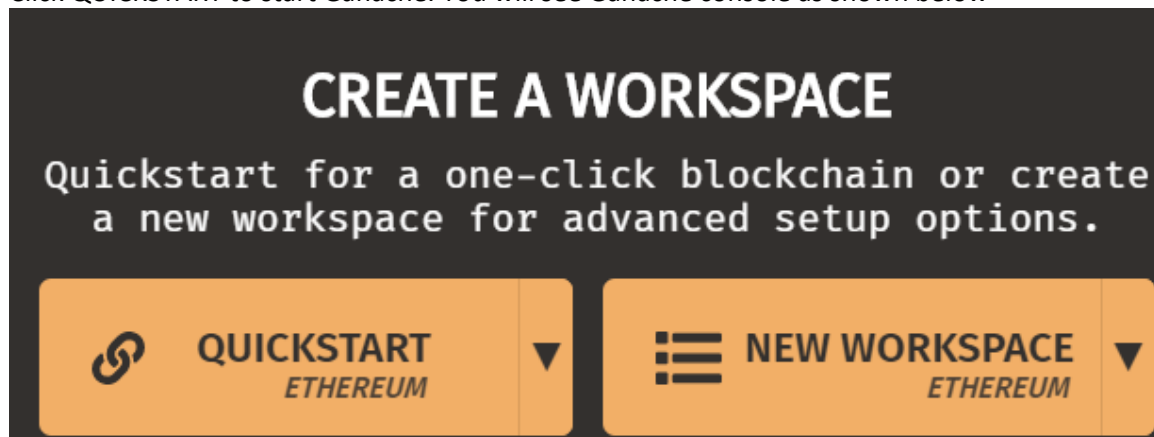
Starting Ganache

Now locate **Ganache** in your Application folder and double-click on its icon to start Ganache.

Ganache Desktop

When Ganache starts, the Ganache screen will appear as shown below

Click QUICKSTART to start Ganache. You will see Ganache console as shown below



The console in the below screenshot (accounts tabs activated) shows two user accounts with balance of 100 ETH (Ether - a currency for transaction on Ethereum platform). It also shows a transaction count of zero for each account. As the user has not performed any transactions so far, this count is obviously zero.

ACCOUNTS BLOCKS TRANSACTIONS CONTRACTS EVENTS LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK 0 GAS PRICE 2000000000 GAS LIMIT 6721975 HARDFORK MUIRGLACIER NETWORK ID 5777 RPC SERVER HTTP://127.0.0.1:7545 MINING STATUS AUTOMINING WORKSPACE QUICKSTART SAVE SWITCH

MNEMONIC ?
tube involve fan tattoo regular erosion plastic vacuum brush goose spin coconut

HD PATH
m/44'/60'/0'/0/account_index

ADDRESS	BALANCE	TX COUNT	INDEX
0x68763bE74904361271B67d3bC574B581E857AeC6	100.00 ETH	0	0
0x3F8602D5CcE98c2721839BF0D8d37eB74EA5D0a6	100.00 ETH	0	1

There are 10 accounts created automatically.

We will now get an overview of a few important screens of Ganache that are of immediate relevance to us.

On the Ganache Desktop, at the top we have several menu options. Clicking on the TRANSACTIONS menu shows all the transactions performed so far. You will be performing transactions very soon. Now, come back to the above screen and check the transactions from time to time. A typical transaction screen is as shown below

TRANSACTIONS ACCOUNTS BLOCKS CONTRACTS EVENTS LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK 3 GAS PRICE 2000000000 GAS LIMIT 6721975 HARDFORK PETERSBURG NETWORK ID 5777 RPC SERVER HTTP://127.0.0.1:8545 MINING STATUS AUTOMINING WORKSPACE SELECTIVE-STORE SWITCH

TX HASH	FROM ADDRESS	TO CONTRACT ADDRESS	GAS USED	VALUE
0xc072f02ca1b9f9293478c83281901927b612ead400183e2efecb212a45276900	0xA9d226800d37a652bf1d0a61218C18e6e4652F64	0xDb756e6C4cBBb46A23f7dDFAE3DfC210F685A8a4	32137	0
0x11508071af42a8980b59aa3673d7a6496fa366bb116418bf77f76c384afe8964	0xB9edfE2434918245CceA5bBd3d4fD29478B8e376	0xDb756e6C4cBBb46A23f7dDFAE3DfC210F685A8a4	47137	0
0x26d0341af375c95356653f1f14902497f1fb7eb3defb274201124cd832b591a1	0xB9edfE2434918245CceA5bBd3d4fD29478B8e376	0xDb756e6C4cBBb46A23f7dDFAE3DfC210F685A8a4	167215	0

Likewise, when you click on the BLOCKS menu, you will see the various mined blocks. Consider the following screenshot to understand how the BLOCKS menu looks like

ACCOUNTS	BLOCKS	TRANSACTIONS	CONTRACTS	EVENTS	LOGS	SEARCH FOR BLOCK NUMBERS OR TX HASHES	
CURRENT BLOCK 3	GAS PRICE 2000000000	GAS LIMIT 6721975	HARDFORK PETERSBURG	NETWORK ID 5777	RPC SERVER HTTP://127.0.0.1:8545	MINING STATUS AUTOMINING	WORKSPACE SELECTIVE-STORE
BLOCK 3	MINED ON 2019-03-30 20:08:06		GAS USED 32137		1 TRANSACTION		
BLOCK 2	MINED ON 2019-03-30 19:57:25		GAS USED 47137		1 TRANSACTION		
BLOCK 1	MINED ON 2019-03-30 19:48:01		GAS USED 167215		1 TRANSACTION		
BLOCK 0	MINED ON 2019-03-30 19:16:03		GAS USED 0		NO TRANSACTIONS		

Click on the LOGS menu. It will open the system log for you. Here, you can examine the various operations that you have performed on the Ethereum Blockchain.

Now, as you have understood how to use Ganache for setting up a private Ethereum Blockchain, you will now create a few clients who would use this Blockchain.

Click settings on the left (gear icon).

WORKSPACE
SERVER
ACCOUNTS & KEYS
CHAIN
ADVANCED
ABOUT
CANCEL
RESTART

Restarting the Quickstart workspace resets the blockchain. All transactions and contract states will be reset.

WORKSPACE

WORKSPACE NAME
Quickstart

A friendly name for this workspace.

TRUFFLE PROJECTS

Link Truffle projects to this workspace by adding their truffle-config.js or truffle.js file to this workspace.
This will show useful contract and event data to better understand what's going on under the hood.

ADD PROJECT
REMOVE PROJECT

Click on Accounts & Keys to see the settings for it.



Restarting the Quickstart workspace resets the blockchain. All transactions and contract states will be reset.

ACCOUNTS & KEYS

ACCOUNT DEFAULT BALANCE

100

The starting balance for accounts, in Ether.

TOTAL ACCOUNTS TO GENERATE

10

Total number of Accounts to create and pre-fund.

AUTOGENERATE HD MNEMONIC



Turn on to automatically generate a new mnemonic and account addresses on each run.

Enter Mnemonic to use

Enter the Mnemonic you wish to use.

note: this mnemonic is not secure; don't use it on a public blockchain.

LOCK ACCOUNTS



If enabled, accounts will be locked on startup.

Here you would be able to set the default balance for each account. The default value is 100. This now explains why you saw 100 ETH displayed for each account in the Desktop screenshot. You can also set the number of accounts on this screen. The value displayed in this screenshot is 2 and that is why the desktop showed only two accounts.

To make any transactions you need to connect a Wallet. Let's connect Metamask. Goto Ganache settings, get the ip address (under hostname) and the port number. Use this number for Metamask.



Restarting the Quickstart workspace resets the blockchain. All transactions and contract states will be reset.

SERVER

HOSTNAME

127.0.0.1 - Loopback Pseudo-Interface 1 ▼

The server will accept RPC connections on the following host and port.

PORT NUMBER

7545

NETWORK ID

5777

Internal blockchain identifier of Ganache server.

AUTOMINE



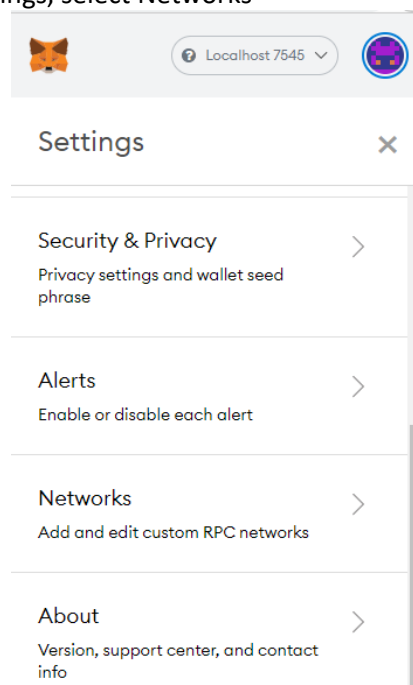
Process transactions instantaneously.

ERROR ON TRANSACTION FAILURE

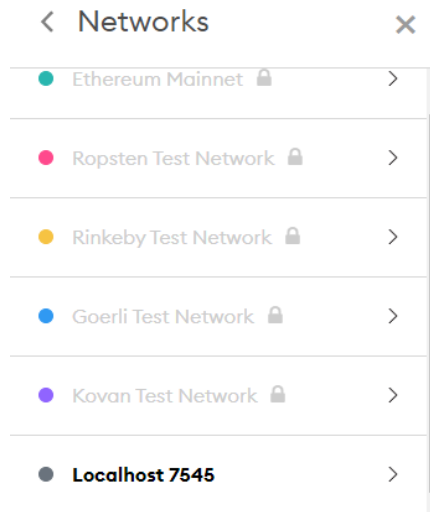


When transactions fail, throw an error. If disabled, transaction failures will only be detectable via the "status" flag in the transaction receipt. Disabling this feature will make Ganache handle transaction failures like other Ethereum clients.

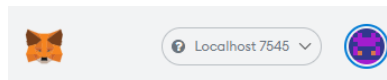
Login to Metamask, go to Settings, select Networks



Select Localhost 8545



Add Network



< Networks ×

Network Name

Localhost 7545

New RPC URL

http://localhost:7545

Chain ID ⓘ

1337

Currency Symbol (optional)

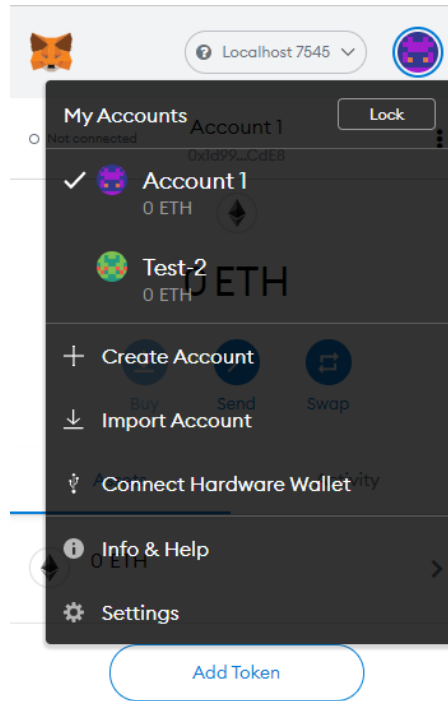
ETH

Block Explorer URL (optional)

Cancel Save

Change the 8545 to 7545 (or as per Ganache). Save it. Network ID is 1337 (won't accept 5777)

Copy the **private key** from account (index 0) in Ganache by clicking on the Key icon in Ganache Desktop. Go to Metamask and create another account by Import Account. Copy the private key into the account.



MetaMask interface showing the 'Import' tab selected. The 'Create' and 'Hardware' tabs are also visible. A warning message states: 'Imported accounts will not be associated with your originally created MetaMask account seedphrase. Learn more about imported accounts [here](#).'

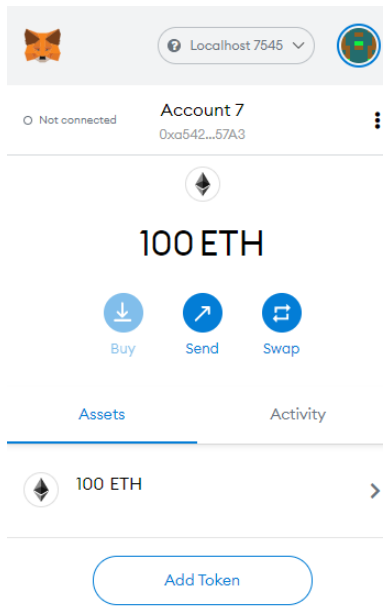
Select Type: Private Key

Paste your private key string here:

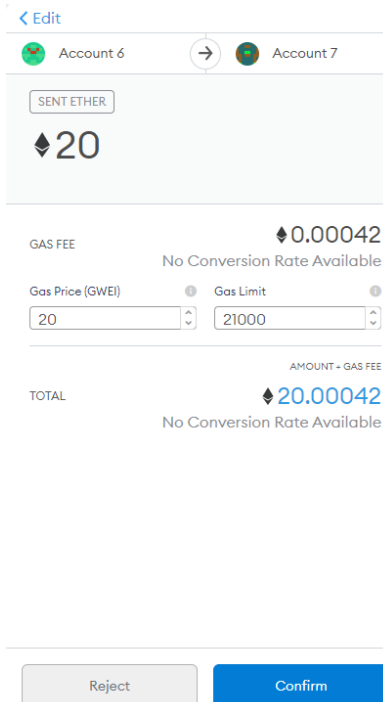
.....

Cancel Import

You will see the accounts have 100 ETH (after a while). Do so for another account.



Do a small transaction from one account to another account. Check the blocks created.



Check out the Ganache Desktop. 20 ETH have been transferred between accounts.

ACCOUNTS

BLOCKS

TRANSACTIONS

CONTRACTS

EVENTS

LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK
1

GAS PRICE
20000000000

GAS LIMIT
6721975

HARDFORK
MUIRGLACIER

NETWORK ID
5777

RPC SERVER
HTTP://127.0.0.1:7545

MINING STATUS
AUTOMINING

WORKSPACE
QUICKSTART

SAVE

SWITCH

MNEMONIC

tide sister right nurse tilt excuse daughter refuse tooth elbow detect party

HD PATH
m/44'/60'/0'/0/account_index

ADDRESS	BALANCE	TX COUNT	INDEX	
0x8512dfBFa6000d0C72A92659A7c8019ECBcd0146	80.00 ETH	1	0	
ADDRESS	BALANCE	TX COUNT	INDEX	
0xa54212bF0b5581Fe3657Cc11A47ed794239F57A3	120.00 ETH	0	1	

ACCOUNTS

BLOCKS

TRANSACTIONS

CONTRACTS

EVENTS

LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK
1

GAS PRICE
20000000000

GAS LIMIT
6721975

HARDFORK
MUIRGLACIER

NETWORK ID
5777

RPC SERVER
HTTP://127.0.0.1:7545

MINING STATUS
AUTOMINING

WORKSPACE
QUICKSTART

SAVE

SWITCH

TX HASH
0x28b0ac068ace10670c01547cae727f583e633225ca2dd93013fab3fca70a99c4

CONTRACT CALL

FROM ADDRESS
0x8512dfBFa6000d0C72A92659A7c8019ECBcd0146

TO CONTRACT ADDRESS
0xa54212bF0b5581Fe3657Cc11A47ed794239F57A3

GAS USED
21000

VALUE
2000000000000000000

ACCOUNTS

BLOCKS

TRANSACTIONS

CONTRACTS

EVENTS

LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK
1

GAS PRICE
20000000000

GAS LIMIT
6721975

HARDFORK
MUIRGLACIER

NETWORK ID
5777

RPC SERVER
HTTP://127.0.0.1:7545

MINING STATUS
AUTOMINING

WORKSPACE
QUICKSTART

SAVE

SWITCH

BLOCK 1	MINED ON 2021-04-19 16:53:25	GAS USED 21000	1 TRANSACTION
BLOCK 0	MINED ON 2021-04-19 16:28:47	GAS USED 0	NO TRANSACTIONS