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Metadium Blockchain: Dev Guide Document

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1. Introduction

This document is prepared for the Metadium Blockchain Integration as a reference document for the exchange technical team and any individual developers to support Metadium Blockchain. The current document is based on Metadium Mainnet and Testnet (Kalmia v2).

2. Metadium Blockchain Full Client (*gmet*)

In order to connect with Metadium blockchain, you must install Metadium client, *gmet*, and finish complete block sync.

- **Download Source Code**

The Metadium Client is called Go-Metadium (*gmet*) and was made by forking Ethereum's Go-Ethereum client. The corresponding source code can be downloaded from the [Github Repository](#) master branch.

- **Install**

Please refer to the [readme](#) file in the github repository for installation instructions.

If you prefer docker environment, please use docker images to build go-metadium which has the least dependency issues.

Developer has to install the following libraries to launch *gmet* at Ubuntu 18.04.2 LTS (GNU/Linux 4.15.0-1021-aws x86_64) machine.

```
sudo apt-get install -y libtbb2 libzstd1 libjemalloc1 libsappy1v5 liblz4-1 libstdc++6
```

After installing, run "*gmet metadium new-account*" to create an account on your local node. You should now be able to run *gmet* and connect to either Mainnet or Testnet network. Make sure to check the different options and commands with "*gmet --help*"

Below is the recommended command to start *gmet* node as a full data sync node.

```
## MAINNET
{data_folder}/bin/gmet --syncmode full --datadir {data_folder} --rpc --rpcaddr 0.0.0.0

## TESTNET
{data_folder}/bin/gmet --testnet --syncmode full --datadir {data_folder} --rpc --rpcaddr 0.0.0.0
```

If you would like to start *gmet* with fast sync, please give the same command without "*--syncmode full*" option.

Note that you don't need to specify bootnode. Pre-defined bootnodes are embedded in the binary code of *gmet* executable. If you want add extra bootnode, please specify extra boot node manually when you start *gmet* at the command line.

- **Address Format**

Since the address system of Metadium is the same as that of Ethereum, it is possible to use the Ethereum address as it is (e.g., 0x0300cef240e54a14329f2dd4bf21bc5ca394eec1). In other words, the exchange that supports Metadium ERC20 can use the same address without changing the customer's cold wallet address. You can download Metadium Keepin App for both [Android](#) and [iOS](#) mobile phone.

- **Coin Balance**

The Metadium Team has frozen the Metadium ERC20 contract at 3 AM UTC on February 22, 2019. A snapshot of the frozen ERC20 token has been recorded in the genesis block when Mainnet started. The amount is converted to at a 1: 1 ratio (i.e., 100 ERC20 Meta Token = 100 Metadium Mainnet Coin). If you are ERC20 META holder, please go to Metadium block explorer and check your balance with the same address. [Mainnet Block Explorer](#)

- **Interface (JSON RPC)**

Metadium supports all Go-Ethereum [RPC](#) without modification. Below is the cURL command for testing using Metadium Testnet/Mainnet Open API server.

The default RPC port for *gmet* is 8588 for both Mainnet and Testnet, and you can change it to 8545, which is the same as geth, using the “*--rpcport 8545*” option when running *gmet* if you prefer.

Moreover, the default P2P port for *gmet* is 8589 for both Mainnet and Testnet,

```
## MAINNET
curl -i -X POST -H "Content-Type: application/json" -d '{"jsonrpc": "2.0", "method": "eth_getBalance", "params": ["0x47f7b1714603beEBf0643e7bA5c7D7c9b7eF7D27", "latest"], "id": 1}' https://api.metadium.com/prod

## TESTNET
curl -i -X POST -H "Content-Type: application/json" -d '{"jsonrpc": "2.0", "method": "eth_getBalance", "params": ["0x47f7b1714603beEBf0643e7bA5c7D7c9b7eF7D27", "latest"], "id": 1}' https://api.metadium.com/dev
```

- **[Network ID & Chain ID](#)**

Metadium uses the same network ID and chain ID pair. Please use 11 for the mainnet and 12 for the testnet especially when you are using Metamask like applications.

- **Transaction Fee**

Gmet 's default gas price is 80 Gwei, and if it is lower than this, confirmation may be delayed. When you create a withdrawal transaction on the exchange, you must read and use the current network's gas price through the *eth_gasPrice* RPC as shown below.

This is how to get gas price to use for sending transaction.

```
## MAINNET
curl -i -X POST -H "Content-Type: application/json" -d
'{"jsonrpc": "2.0", "method": "eth_gasPrice", "params": [], "id": 1}'
https://api.metadium.com/prod

## TESTNET
curl -i -X POST -H "Content-Type: application/json" -d
'{"jsonrpc": "2.0", "method": "eth_gasPrice", "params": [], "id": 1}'
https://api.metadium.com/dev
```

3. Block Explorer

Metadium Block Explorer is a web tool that provides detailed information about Metadium blocks, addresses, and transactions. It provides almost all the functions of Etherscan including contract verification, read, write, and much more. It has also unique Open API services to subscribers for free. Don't miss out – subscribe today! Please try by yourself at [Mainnet Explorer](#) and [Testnet Explorer](#).

4. Testnet META Faucet

Testnet META, a native coin used in the Metadium blockchain, can be obtained from the [Testnet Meta Faucet](#). Faucet sends a 10 META coin immediately to the requested address. Please note that the faucet has a limitation depending on the balance of the requested address, requester's IP address, and the time interval of the consecutive requests for transmission.

If you need a large amount of META to use in the dev/ staging system of the exchange, you can contact tech@metadium.com to get it.

5. Block Interval

Metadium's consensus algorithm is SPoA (Staking-based Proof of Authority) and the details of the consensus algorithm will be released to the public in a separate sheet.

	Testnet	Mainnet
--	---------	---------

Block Interval with pending transactions	immediate	immediate
Block Interval with no pending transaction	5 second	5 second

6. BIP32 HD wallet Rule (Reference)

Metadium Mainnet is registered in SLIP-0044 (Registered coin types for BIP-0044). The basic path of private key generated by mnemonic is as follows.

<code>m/44'/916'/0'/0</code>

<https://github.com/satoshilabs/slips/blob/master/slip-0044.md>

The basic path should be used when creating an app or web service that directly generates a private key for Metadium blockchain.

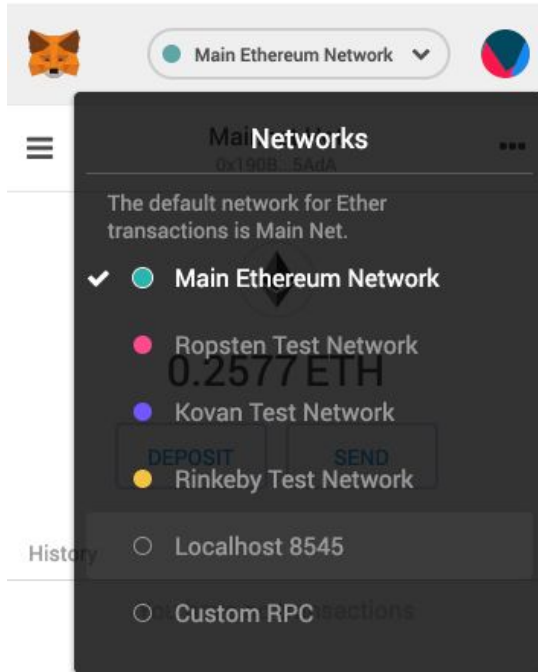
7. How to Connect Metamask with Metadium Testnet

Metamask can be used to send / receive META with Metadium blockchain. It is also possible to distribute and interact with contracts at <http://remix.ethereum.org/> using metamask.

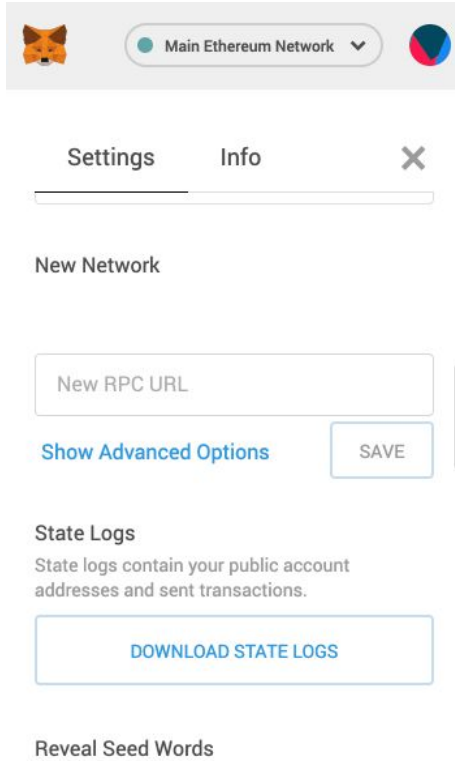
Remember to set the gas price to 80 GWei or higher when you send via metamask.

Step#1: Install Metamask Chrome Extension [Web Store](#)

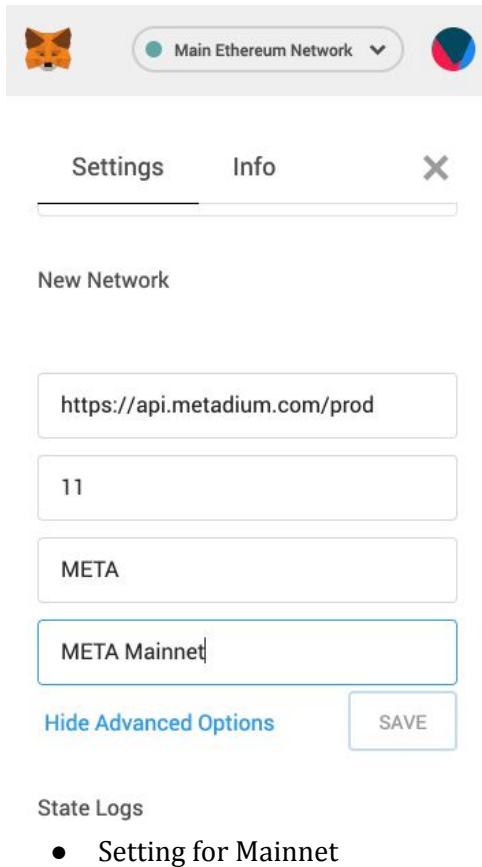
Step#2: At Networks → Choose “Custom RPC”



Step#3: At Settings → Choose “Show Advanced Options”



Step#4: Type Metadium Network Info → Save → Close Settings

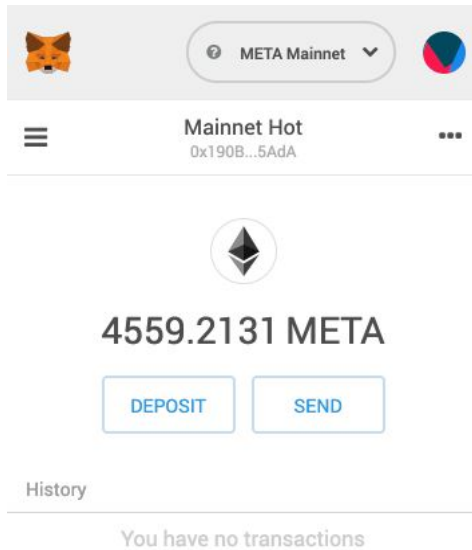


1. New RPC URL: <https://api.metadium.com/prod>
2. ChainID: 11
3. Symbol: META
4. Nickname: META Mainnet

- Setting for Testnet

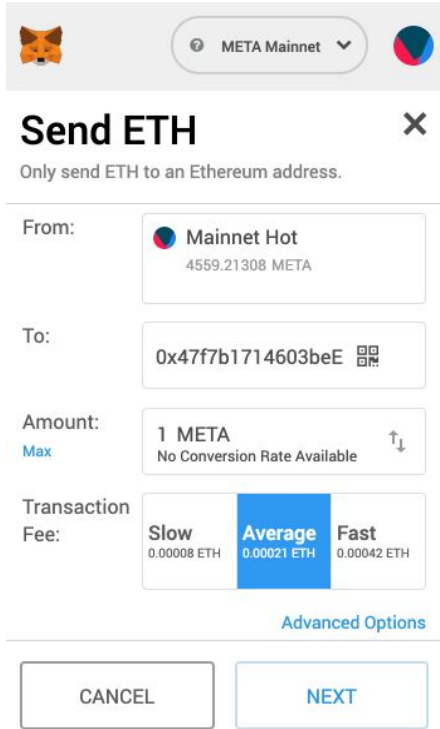
5. New RPC URL: <https://api.metadium.com/dev>
6. ChainID: 12
7. Symbol: META
8. Nickname: META Testnet

Step#5: You are now connected to Metadium Network (either Mainnet or Testnet)



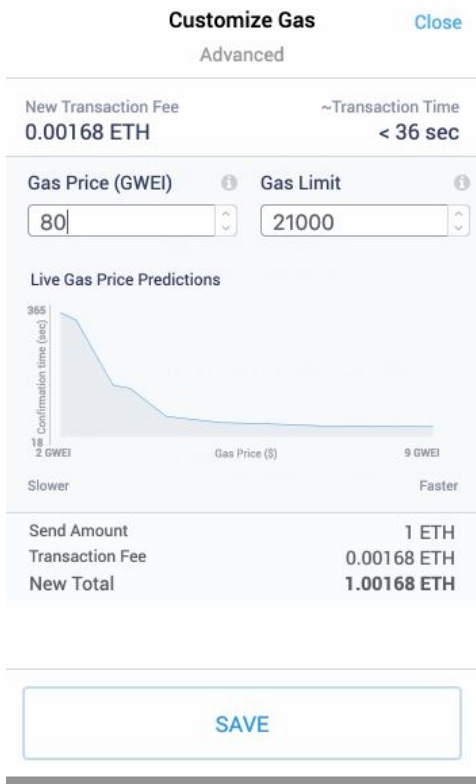
Step#6: Check your balance

Step#7: Click Send → Fill To/Amount fields → Choose “Advanced Options”





The interface shows a 'Send ETH' modal with a close button (X). Below the title is the instruction 'Only send ETH to an Ethereum address.' The form includes fields for 'From' (Mainnet Hot, 4559.21308 META), 'To' (0x47f7b1714603beE), 'Amount' (1 META, No Conversion Rate Available), and 'Transaction Fee' (Slow: 0.00008 ETH, Average: 0.00021 ETH, Fast: 0.00042 ETH). An 'Advanced Options' link is present, followed by 'CANCEL' and 'NEXT' buttons.

Step#8: Change Gas Price (GWEI) to 80 at least → Save → Next → Confirm




The 'Customize Gas' interface shows a 'Close' button and 'Advanced' mode. It displays 'New Transaction Fee' (0.00168 ETH) and '~Transaction Time' (< 36 sec). Input fields for 'Gas Price (GWEI)' (80) and 'Gas Limit' (21000) are shown. A 'Live Gas Price Predictions' graph plots 'Confirmation time (sec)' against 'Gas Price (\$)' from 2 GWEI to 9 GWEI. A summary table shows: Send Amount: 1 ETH, Transaction Fee: 0.00168 ETH, New Total: 1.00168 ETH. A 'SAVE' button is at the bottom.


Field	Value
Send Amount	1 ETH
Transaction Fee	0.00168 ETH
New Total	1.00168 ETH


 ? META Mainnet 

Send ETH ✕

Only send ETH to an Ethereum address.




From:  **Mainnet Hot**
4559.21308 META

To: 0x47f7b1714603beE 

Amount: Max 1 META No Conversion Rate Available 

Transaction Fee: 0.00168 META Reset
0.00168 META

[< Edit](#) ? META Mainnet

 Mainnet Hot   Account 1

1

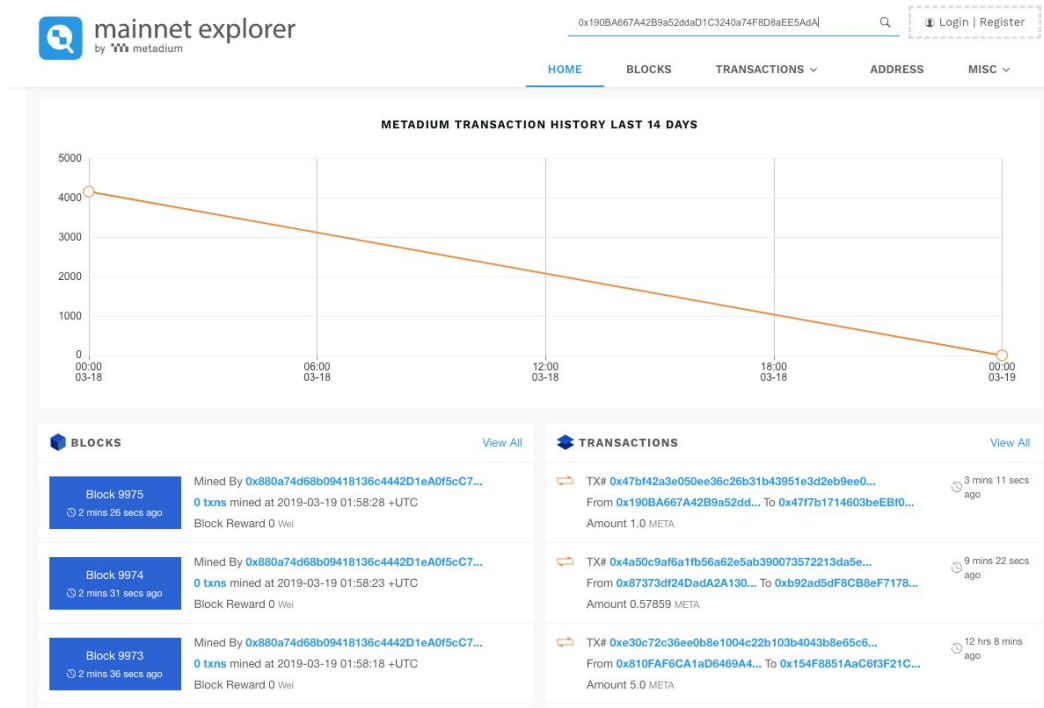
EDIT

GAS FEE 0.00168
No Conversion Rate Available

TOTAL 1.00168
AMOUNT + GAS FEE
No Conversion Rate Available

The screenshot shows a mobile application interface for a wallet. At the top, there is a header with a fox icon, a dropdown menu set to "META Mainnet", and a profile icon. Below the header, the wallet name "Mainnet Hot" and a partial address "0x190B...5AdA" are displayed. The main section shows the Meta logo and a balance of "4558.2114 META". Two buttons, "DEPOSIT" and "SEND", are visible. A "History" section below shows a transaction: "#3 - 3/19/2019 at 10:57" with a "Sent Ether" icon, a "CONFIRMED" status, and a value of "-1 META".

Step#9: Copy source or destination address → Go [Metadium Block Explorer](#) → Copy Address to search window and Enter → [See transaction lists of address](#)



Address Information

Type:	Miner
Balance:	4,558.2114 META
Appear date:	2019-03-18 12:02:56 +UTC
Transactions:	6 txns

Transactions **MRC20 Token Txns**

Total 6 transactions found
showing the last 500k records

TxHash	Block	Age	From	To	Value	[TxFee]
0x47b42a3e050ee36c26b31b43951...	9966	1 mins 38 secs	0x190BA667A42B9a52dd...	OUT 0x477b1714603beEB10...	1.0 META	0.00168 META
0x42716b73fbcc5ed08a824c69aa...	1253	12 hrs 7 mins	0x190BA667A42B9a52dd...	OUT 0x810FAF6CA1aD6469A4...	10.0 META	0.00168 META
0x494ac3d80f29c58be8b1332ced0...	818	12 hrs 44 mins	0x190BA667A42B9a52dd...	OUT 0x87373df24DadA2A130...	10.0 META	0.00168 META
0x10bc986d079bf12aa91f65b5ed9...	753	12 hrs 49 mins	0xd2ced71Da3E141D067...	IN 0x190BA667A42B9a52dd...	5.0 META	0.00168 META
0x322655c9de4d0843824ce571796c...	736	12 hrs 51 mins	0x190BA667A42B9a52dd...	OUT 0xd2ced71Da3E141D067...	10.0 META	0.00168 META
GENESIS_0x190BA667A42B9a52ddaD...	0	13 hrs 56 mins	GENESIS	IN 0x190BA667A42B9a52dd...	0 Wei	0 Wei

Step#10: Check your balance

8. Link

- **Source Code**

<https://github.com/metadium/go-metadium>

- **Open API Server**

<https://api.metadium.com/prod> and <https://api.metadium.com/dev>

- **Block Explorer**

<https://explorer.metadium.com> and <https://testnetexplorer.metadium.com>

- **Test Meta Faucet**

<https://testnetfaucet.metadium.com>

- **Gmet Install Guide**

<https://github.com/METADIUM/go-metadium/blob/master/README.md>

9. Contact

- **Technical Support**

tech@metadium.com