Welcome to GateChain's Documents.

The documents will give you a summary of GateChain, its basic concepts, features, and functions. Tutorials and technical information are provided from beginner to professional, including Command Line Interface (CLI) and API walkthroughs.

The documents are updated regularly alongside GateChain's development. Follow us and stay tuned!

GateChain sets out to solve the very interesting and complex problems that emerged alongside blockchains, without compromising any decentralized aspects or advantages. The ecosystem comprises of the GateChain mainnet, GateChain DEX, GT, wallets, and more; forming an enterprise-grade decentralized ecosystem that can store, issue and trade digital assets efficiently and securely.

The main features of GateChain's ecosystem can be listed as follows:

1. **Transfers/Payments**：Using a wallet or client-side Apps, users can send and receive GateTokens GT, as well as popular onchain assets.
2. **Asset Issuance**：Users can issue their own tokens to digitalize and manage their assets. For more details, visit Asset Management.
3. **Multi-Signature**: Multiple individuals can share ownership of an account, and customize its management, suitable for both enterprise and family demands. For more details, visit Multi-signature.
4. **Asset Safe Storage**: With a uniquely designed vault account and a clearing mechanism, an account can be 100% secure with revoking/clearing functions countering abnormal transactions. For more details, visit Transaction Protection.
5. **PoS Consensus Mechanism**: GT works as a stable incentive for users participating in staking, ensuring the underlying health and stability of the ecosystem.PoS Mining.

GateChain Blockchain

GateChain is a novel next-generation public blockchain, focused on onchain asset safety and decentralized trading. With a uniquely designed Vault Account and its functions for handling abnormal transactions, GateChain presents a never before seen clearing mechanism, tackling the challenging problems of asset theft and private key loss. Decentralized trading and cross-chain transfers will also be supported alongside other core features. GateChain focuses on on-chain asset safety and introduced the following novel concepts: Normal Account、Vault Account、Retrieval Account、Clearing Height、Revocable Delay Period、Address Type、Transaction Type.

GateToken

GateToken (GT) is the native currency of GateChain's ecosystem. It is used to pay for transaction fees on GateChain’s network and also serves as the PoS staking reward. It is essential to GateChain's functions.

GateChain Wallets

GateChain provides various wallet applications ranging from personal to professional use cases.

- During the testnet phase, GateChain provided desktop wallets for Windows and Mac OS; professional users could also access and test the API.
- During the mainnet phase, GateChain will provide a wider variety, to cater for every kind of necessity: {command-line interface wallet | mobile wallet (Android/iOS) | web wallet | multi-signature wallet | hardware wallet}

GateChain offers two types of accounts, either a Normal or a Vault Account, enabling users to seamlessly navigate through the digital era without any safety concerns. Normal Accounts can pay instantly and transactions are irreversible. Private keys cannot be restored, similar to how a bitcoin address functions. The Vault Account though, GateChain's innovations, features revocable transactions and private key restoration. By combining both types of accounts, GateChain provides total safety to its users.

Individual asset management

A Normal Account is used to store a fraction of assets for daily use while a Vault Account is used to store the majority, not in immediate need. The Vault Account can set a predetermined transfer delay period, (e.g. 2 days).

For everyday transactions, users can use assets in the Normal Account just like they would on a bitcoin address: a transaction is confirmed upon payment and is irreversible. In the case of a Normal Account's private key loss/theft, the loss is limited to that "daily allowance". Risk is still under control. A Normal Account can be topped up by transfering from the Vault Account and the amount will be received after the revocable delay period that's been set. If a private key theft/loss is found during this period, a "Revoke" request can be initiated from the Vault Account. The transaction will be revoked and moved to the “Retrieval Account”. Funds are safe.

Legacy or Grant Auto-Release

Digital asset inheritance has been a point of concern for many as it can not be executed similar to bank assets and real estate under the existing applicable laws. The private keys of digital assets are usually kept by the holder himself for security reasons. Without elaborate planning, digital assets can be forever frozen following the death of the holder and leave his lawful heirs no way to access to his legacy. GateChain's Vault Accounts support the release of digital assets at a predetermined time to a beneficiary, without having to worry about private keys loss/theft.

As long as one is able to set his digital asset distribution ratio and release date, his digital asset will be transferred to his named beneficiary accordingly. This feature can also be used in any scenario where a future release of funds at predetermined time is required. (E.g. After a child's 18th birthday, university fund and so on)

Safe Storage

Asset storage demands an extremely high level of safety. The prevailing mechanisms in the blockchain industry are cold storage and hardware wallets. Even these mechanisms, though, cannot guarantee the assets' safety when it comes to asset risks arising from private key loss/theft. Safety concerns have significantly hindred the massive adoption of blockchain assets.

With GateChain’s Vault Account, revocable delay periods can be set to significantly reduce asset storage risk. Vault Accounts cascading is also supported, exponentially reducing risks of theft.

In practice, GateChain can achieve complete asset safety at a very low cost. In addition, our hardware wallet with touch-id will be there to help you safeguard your assets!

"EVM" is a newly added GateChain module that supports smart contracts, enabling projects to build and deploy their products on GateChain~opening its doors to the miraculous world of decentralized finance.

With EVM as the smart engine for “GateChain” , we are now accessing the most active community in the crypto space and a full range of eco-products built on "Ethereum" network. "Ethereum" network has incubated a myriad of premium projects over the past few years, some of them even exploring the very frontier for the whole industry. With all those innovations made possible on top of the EVM, compatible to EVM has been one of the basic capabilities for most mainnets.

"GateChain" went live in 2019 and has since been running stably, proving native innovative features such as vault account, clearing mechanism and more to users, with its underlying protocol, Gatemint, provides the security to the whole decentralized network. Unlike a trade-off solution most public chains use, "EVM" has native functionality on "GateChain" mainnet. Users can deploy/call smart contract without transfer asset cross chains. This way, users can benefit from the native security features at a minimum migration cost.

To help users and developer migrating effortlessly from "Ethereum" to "Gatechain", we have added support for a new account type - "EVM-Account", which is consistent with a standard "Ethereum" account in usage, format and security, allowing "Ethereum" users to start using "EVM" functionalities on the "GateChain", even without creating a new account on "GateChain".

While providing the easy-to-use, we are also providing the native asset security features to "GateChain" users. "EVM-Account" can transfer to and from a "GateChain" native "Vault-Account" directly, allowing users to use revocable transactions, and clearing features to get the utmost asset security.

Besides compatibility on account level, "GateChain-EVM" is fully compatible with "EVM" smart contract code. Any smart contract that runs on "Ethereum" will run on GateChain seamlessly.

"GateChain-EVM" supports a full range of "Ethereum" ecosystem products. Browser wallet (e.g MetaMask)[How to Connect], developer tools, (e.g Remix)[How to Connect] ，can easily connect to "GateChain" to help you get started and play in the DeFi world. For example, you can simply set up the "GateChain" network and use the same private key/public key/address on "Ethereum" account to make transfers and contracts calls. Note: using the same private key/public key/address is highly discouraged.

"GT" as the fuel to "GateChain" mainnet is also used as the only asset to pay Gas in "GateChain-EVM". A certain amount of "GT" will be needed to deploy and call contracts. This will extend the GT usage and benefits GT holders.

When we developing the idea of "GateChain-EVM", we are inspired by the following two projects: go-ethereum and Ethermint We would like to express our special thanks to them.

"GateChain-Evm" is the native module based on "Gatemint" consensus, which supports "Ethereum" smart contracts and provides rpc services to connect to "MetaMask". Users can deploy and call contracts on "GateChain" by simply switching to "GateChain" network.

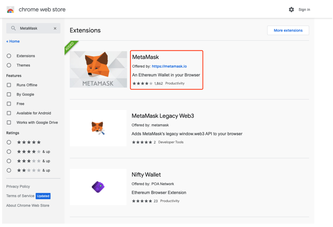
MetaMask Introduction

"MetaMask" is created to build a more safe and accessible "Ethereum" network. It connects users to blockchain and manage accounts, supported on Chrome, Brave and Safari.

Install

Example: Install in Chrome browser

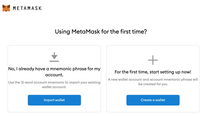
1. In Chrome browser, Download
   - note：make sure it is provided by metamask.io



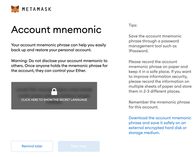
2. CLick "Add to Chrome". It is installed now and you can create your account.

Create Account

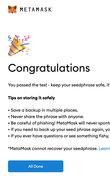
1.You can choose to import a wallet or create a wallet. Click "Create a wallet"



2.Enter password and backup account mnemonic

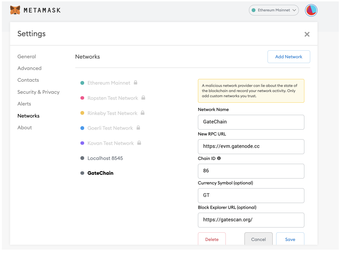


3.When the mnemonic is verified, the account is successfully created. You can connect to gatechain now!



Connect MetaMask to GateChain

1. Click MetaMask-Setup-Network-Add Network, and configure GateChain network service



- Network name: GateChain （customized）
- RPC URL1: https://evm.gatenode.cc
- RPC URL2: https://evm-hk.gatenode.cc
- Chain ID: 86
- Symbol: GT
- Block explorer: https://gatescan.org

Transfer balance from your "gt" account to your MetaMask account.

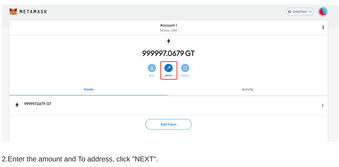
1. Transfer from your wallet: copy an MetaMask account address, and paste to the recipient wallet field in your wallet. Transfer- To [Step by step instruction]

2. Transfer using CLI or RPC：similar to a transfer from a wallet, just provide the recipient address to send transaction to.

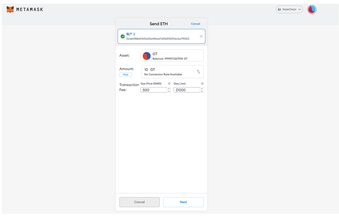
> [CLI User Guide]
> [API User Guide]

Transfer GT to another MetaMask account

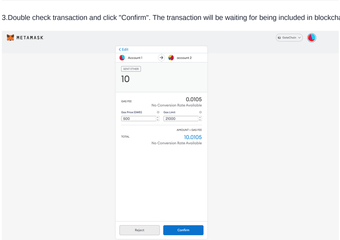
1.Chose the account to send asset to, then got to Homepage and click"Send"button



2.Enter the amount and To address, click "NEXT".



3.Double check transaction and click "Confirm". The transaction will be waiting for being included in blockchain.



4.When the transaction is successful, view transaction details from a gatechain block explorer.

- BLock explorer：Click to enter

> Read below for how to deploy contract and interact with contract.

GateChain Research focuses on studying principles and applications around onchain trading safety, promoting the blockchain development and its use cases.

GateChain's major innovations are：

- An on-chain “Vault Account”. A safety solution to individuals, enterprises, and asset sensitive banks.
- A transaction model that supports retractable logic, called RTM（Revokable Transaction Model）.

Please refer to GateChain Academic Research for more details.

As an innovative public chain focusing on on-chain asset security, GateChain introduces a number of new concepts. GateChain hopes to help users understand GateChain’s security logic more comprehensively by providing the description of the concepts. Also, for the consideration of transaction security, GateChain innovatively put forward the identification of address type and transaction type to facilitate the user to effectively identify different account type and transfer type, to avoid user mis-operation.

GateChain Basic Concepts

GateChain is a novel public chain. Its principal research has introduced many novel concepts that form the principle fundamentals for building complete self-consistency in assets safety.

- Normal Account：Storage of assets, suitable for daily use. Assets in this type of account can be sent instantly and transactions are irreversible once confirmed on-chain. Lost private key can not be restored.
- Vault Account：A new type of account that features revocable transactions. Assets in this type of account are transferred after a preset delay. Suitable for storage and safekeeping of funds not ment for immediate use.
- Revocable Delay Period：The time period during which a transaction from a vault account is revocable. During this period (calculated in blocks), recovery of funds is possible by initiating a "revoke" request and have the funds sent to the “Retrieval Account’.
- Retrieval Account：A predetermined account bound to the Vault Account. When a transaction is revoked, the assets will be transferred to this account.
- Clearing Height：A future block height. When this block height is reached, the assets in the account are transferred according to the account holders' instructions.
- Revoke: When a transaction initiated from a Vault Account is still in the revocable delay period, “revoke” request can be initiated and the assets will be sent to the “Retrieval Account’.
- Revocable Transaction： A transaction initiated from a Vault Account is a revocable transaction, allowing assets to be transfered to the “Retrieval Account” instead of the original address. After the revocable period, transaction can not be revoked.
- Irrevocable Transaction：Transactions initiated from Normal Accounts. It is irreversible once it is confirmed by blockchain.

GateChain Address Types

GateChain has two main account types, Normal Account, and Vault Account, with a different identifier at the start of their addresses.

- Normal Account：starts with "gt". "gt1" indicates a single-signature Normal Account, and "gt2" indicates a multi-signature Normal Account.
- Vault Account：starts with "vault"."vault1" indicates a single-signature Vault Account, and "vault2" indicates a multi-signature Vault Account.

With GateChain's address identifier mechanism, confirmation requirements can be set and carried out accordingly. If a transaction is initiated from a Vault Account, confirmation is safe only after a revocable delay period.

GateChain Transaction Types

GateChain has many transaction types. To identify different transaction types efficiently, GateChain provides a transaction type identifier.

Below are the identifiers that different transaction types can start with:

- Irrevocable Payment：“IRREVOCABLEPAY-”
- Revocable Payment：“REVOCABLEPAY-”
- Account Setting： “ACCOUNTSET-”
- Vault Creation：“VAULTCREATE-”
- Revoke Request: “REVOKE-”
- Vault Clearance：“VAULTCLEAR-”
- Untitled： “BASIC-”

1. GateChain desktop wallet instruction
2. Visit GateChain mainnet explorer

- **Full Node**: Anyone can build a full node and participate in the consensus mechanism or run his own network. A full node has all of GateChain's functions. For detailed installation instructions visit Install and Deploy.
  - **Connect**： A full node can connect to the public mainnet (using the same network version)） to monitor and broadcast transactions, update blocks and other network tasks in real time.
  - **CLI**：Client programs which can interact with GateChain using the command line interface are also provided. Many operations can be performed on your onchain account using a command line interface, including account management, transaction management, and asset management. In addition, simple onchain inquiries can be made rearding account balance and transaction details. For more details visit Command Line Interface Reference.
  - **API**：GateChain Nodes support advanced REST API interface services, for more details visit REST API List.