

# EIYARO Core API Reference

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# Wallet Endpoints

These endpoints are available when we set:  
**config.toml**

```
[wallet]
disable = false
```

This is the default value and we can possibly omit it.

## Create Key Endpoint

Creates a private key. The private key is encrypted in the file and not visible to the user.

### Parameters

Object:

- **String** - **alias**, name of the key.
- **String** - **password**, password of the key.
- **String** - **language**, mnemonic language of the key.

Optional:

- **String** - **mnemonic**, mnemonic of the key, create key by specified mnemonic.

### Returns

Object:

- **String** - **alias**, name of the key.
- **String** - **xpub**, root pubkey of the key.
- **String** - **file**, path to the file of key.

Optional:

- **String** - **mnemonic**, mnemonic of the key, exist when the request mnemonic is null.

## Example

Create key by random pattern:

### Request

```
curl -X POST http://localhost:9888/create-key -d '{"alias": "alice", "password":
```



```
"123456", "language": "en"}'
```

## Response

```
{
  "alias": "alice",
  "xpub":
"a85e6eccb22f4c5fdade905f9a969003a17b6f35c237183a4313354b819a92689d52da3bcfe55f15a5508
77e8d789bd2bb9620f46e5049ea36470ab1b588a986",
  "file": "/home/yang/.eiYRO/keystore/UTC--2024-3-10T07-09-17.509894697Z--341695b9-
9223-470c-a26d-bea210f8e1bb",
  "mnemonic": "verb smoke glory dentist annual peanut oval dragon fiction current
orbit lab load total language female mushroom coyote regular toy slide welcome employ
three"
}
```

Create key by specified mnemonic:

## Request

```
curl -X POST http://localhost:9888/create-key -d '{"alias":"jack",
"password":"123456", "mnemonic":"please observe raw beauty blue sea believe then boat
float beyond position", "language":"en"}'
```

## Response

```
{
  "alias": "jack",
  "xpub":
"c7bcb65febd31c6d900bc84c386d95c3d5b047090628d9bf5c51a848945b6986e99ff70388018a7681fa3
7a240dbd8df39a994c86f9314a61e75feb33563ca72",
  "file": "/home/yang/.eiYRO/keystore/UTC--2024-3-10T07-08-51.815030323Z--46ee932e-
88d3-4680-a5c1-dd9e63918fcc"
}
```

# List Keys Endpoint

Returns the list of all available keys.

## Parameters

None.

## Returns

- **Array of Object**, keys owned by the client.
  - **Object**:
    - **String** - **alias**, name of the key.
    - **String** - **xpub**, pubkey of the key.

## Example

Request a list of the current keys on the node.

### Request

```
curl -X POST http://localhost:9888/list-keys
```

### Response

```
[
  {
    "alias": "alice",
    "xpub":
"a7dae957c2d35b42efe7e6871cf5a75ebd2a0d0e51cafffe767db42d3e6d69dbe211d1ca492ecf05908fe6
fa625ad61b3253375ea744c9442dd5551613ba50aea",
    "file": "/Path/To/Library/Eiyaro/keystore/UTC--2024-03-21T02-35-15.035935116Z--
4f2b8bd7-0576-4b82-8941-6cc6da05efe3"
  },
  {
    "alias": "bob",
    "xpub":
"d30a810e88532f73816b7b5007d413cbd21e526ae9159023e5262511893adc1526b8eacd691b27c080201
d7d79336a4f3d2cb4c167d997821cad445765916254",
    "file": "/Path/To/Library/Eiyaro/keystore/UTC--2018-03-22T06-30-27.609315219Z--
0e34293c-8856-4f5f-b934-37456a3820fa"
  }
]
```

## Update Key Alias Endpoint

Update the alias for an existing key.

### Parameters

**Object**:

- **String** - **xpub**, pubkey of the key.
- **String** - **new\_alias**, new alias of the key.

## Returns

Nothing in case the key alias is updated successfully.

## Example

Update an existing key's alias.

### Request

```
curl -X POST http://localhost:9888/update-key-alias -d '{"xpub":  
"a7dae957c2d35b42efe7e6871cf5a75ebd2a0d0e51cafffe767db42d3e6d69dbe211d1ca492ecf05908fe6  
fa625ad61b3253375ea744c9442dd5551613ba50aea", "new_alias": "new_key"}'
```

### Response

Nothing if the operation was successful.

## Delete Key Endpoint

Deletes an existing key.



Please make sure that there is no balance in the related accounts.

## Parameters

Object:

- **String** - **xpub**, pubkey of the key.
- **String** - **password**, password of the key.

## Returns

Nothing in case the key is deleted successfully.

## Example

Delete an existing key.

### Request

```
curl -X POST {bas-url}delete-key -d '{"xpub":  
"a7dae957c2d35b42efe7e6871cf5a75ebd2a0d0e51cafffe767db42d3e6d69dbe211d1ca492ecf05908fe6  
fa625ad61b3253375ea744c9442dd5551613ba50aea", "password": "123456"}'
```

## Response

Nothing if the operation was successful.

# Check Key Password Endpoint

Check an existing key's password.

## Parameters

Object:

- **String** - **xpub**, pubkey of the key.
- **String** - **password**, password of the key.

## Returns

Object:

- **Boolean** - **check\_result**, if check is successful the value will be true, otherwise it will be false.

## Example

Check the password for an existing key.

## Request

```
curl -X POST http://localhost:9888/check-key-password -d '{"xpub":  
"a7dae957c2d35b42efe7e6871cf5a75ebd2a0d0e51caff767db42d3e6d69dbe211d1ca492ecf05908fe6  
fa625ad61b3253375ea744c9442dd5551613ba50aea", "password": "123456"}'
```

## Response

```
{  
  "check_result": true  
}
```

# Reset Key Password Endpoint

Reset an existing key's password.

## Parameters

Object:

- **String** - **xpub**, pubkey of the key.

- **String** - **old\_password**, old password of the key.
- **String** - **new\_password**, new password of the key.

## Returns

Object:

- **Boolean** - **changed**, if reset is successful the value will be true, otherwise it will be false.

## Example

Reset the password for an existing key.

### Request

```
curl -X POST http://localhost:9888/reset-key-password -d '{"xpub":
"a7dae957c2d35b42efe7e6871cf5a75ebd2a0d0e51caffe767db42d3e6d69dbe211d1ca492ecf05908fe6
fa625ad61b3253375ea744c9442dd5551613ba50aea", "old_password": "123456",
"new_password": "654321"}'
```

### Response

```
{
  "changed": true
}
```

## Create Account Endpoint

Create an account to manage addresses.

Single sign account contains only one **root\_xpubs** and quorum; however multi sign account can contain any number of **root\_xpubs** and quorum.

Quorum is the number of verify signatures, the range is `[1, len(root_xpubs)]`.

## Parameters

Object:

- **Array of String** - **root\_xpubs**, pubkey array.
- **String** - **alias**, name of the account.
- **Integer** - **quorum**, the default value is **1**, threshold of keys that must sign a transaction to spend asset units controlled by the account.

Optional:

- **String** - **access\_token**, if optional when creating account locally. However, if you want to create account remotely, it's indispensable.

## Returns

Object:

- **String** - **id**, account id.
- **String** - **alias**, name of account.
- **Integer** - **key\_index**, key index of account.
- **Integer** - **quorum**, threshold of keys that must sign a transaction to spend asset units controlled by the account.
- **Array of Object** - **xpubs**, pubkey array.

## Example

Create an account with a given **root\_xpubs** and **alias**.

### Request

```
curl -X POST http://localhost:9888/create-account -d
'{"root_xpubs":["2d6c07cb1ff7800b0793e300cd62b6ec5c0943d308799427615be451ef09c0304bee5
dd492c6b13aaa854d303dc4f1dcb229f9578786e19c52d860803efa3b9a"],"quorum":1,"alias":"alic
e"}'
```

### Response

```
{
  "alias": "alice",
  "id": "08F0663C00A02",
  "key_index": 1,
  "quorum": 1,
  "xpubs": [
    "2d6c07cb1ff7800b0793e300cd62b6ec5c0943d308799427615be451ef09c0304bee5dd492c6b13aaa854
d303dc4f1dcb229f9578786e19c52d860803efa3b9a"
  ]
}
```

## List Accounts Endpoint

Returns a list of the available accounts on the node.

### Parameters

Optional:

- **String** - **id**, account id.

- **String** - **alias**, name of account.

## Returns

- **Array of Object**, account array.
  - **Object**:
    - **String** - **id**, account id.
    - **String** - **alias**, name of account.
    - **Integer** - **key\_index**, key index of account.
    - **Integer** - **quorum**, threshold of keys that must sign a transaction to spend asset units controlled by the account.
    - **Array of Object** - **xpubs**, pubkey array.

## Example

Request a list of the accounts present on the node.

### Request

```
curl -X POST http://localhost:9888/list-accounts -d '{"alias":"alice"}'
```

### Response

```
[
  {
    "alias": "alice",
    "id": "086KQD75G0A02",
    "key_index": 1,
    "quorum": 1,
    "xpubs": [
      "180aab8bf247932a7cf68da5cc9a873266279155097612f1e5fdda4add88d5e91e2e7ce5b736f3ac933824cdee9effcf1531b90dfcb388e5cc306d14e9a2c85e"
    ]
  }
]
```

## Update Account Alias Endpoint

Updates an alias for the an existing account.

### Parameters

**Object**: **account\_alias** | **account\_id**

\* **String** - **new\_alias**, new alias of account.

optional:

- **String** - **account\_alias**, alias of account.
- **String** - **account\_id**, id of account.

## Returns

Nothing in case the account alias is updated successfully.

## Example

Update the alias for a given account ID or an account alias.

### Request

```
curl -X POST http://localhost:9888/update-account-alias -d '{"account_id":  
"08F0663C00A02", "new_alias": "new_account"}'  
# or  
curl -X POST http://localhost:9888/update-account-alias -d '{"account_alias": "alice",  
"new_alias": "new_account"}'
```

### Response

Nothing if the operation was successful.

## Delete Account Endpoint

Delete an existing account.



Please make sure that there is no balance in the related accounts.

### Parameters

**Object:** **account\_alias** | **account\_id**

Optional:

- **String** - **account\_alias**, alias of account.
- **String** - **account\_id**, id of account.

## Returns

Nothing if the account is deleted successfully.



## Example

Delete an existing account by account ID or account alias.

### Request

```
curl -X POST http://localhost:9888/delete-account -d '{"account_id": "08F0663C00A02"}'  
# or  
curl -X POST http://localhost:9888/delete-account -d '{"account_alias": "alice"}'
```

### Response

Nothing if the operation was successful.

## Create Account Receiver Endpoint

Creates an address and control program.

The address and control program are a one to one relationship.

In the `build-transaction` endpoint, the receiver is the address when the action is of type `control_address`, and the receiver is the control program when the action is of type `control_program`, both can be used to the same effect.

### Parameters

**Object:** `account_alias` | `account_id`

Optional:

- `String` - `account_alias`, alias of account.
- `String` - `account_id`, id of account.

### Returns

**Object:**

- `String` - `address`, address of account.
- `String` - `control_program`, control program of account.

## Example

Create an account alias on the existing account ID.

### Request

```
curl -X POST http://localhost:9888/create-account-receiver -d '{"account_alias":  
"alice", "account_id": "0BDQARM800A02"}'
```

## Response

```
{
  "address": "ey1q5u8u4eldhjf3lvnkmyl78jj8a75neuryzlknk0",
  "control_program": "0014a70fcae7edbc931fb276d93fe3ca47efa93cf064"
}
```

## List Addresses Endpoint

Returns the sub list of all available addresses by account with a limit count.

### Parameters

- **String** - **account\_alias**, alias of account.
- **String** - **account\_id**, id of account.
- **Integer** - **from**, the start position of first address
- **Integer** - **count**, the number of returned

### Returns

- **Array of Object**, account address array.
  - **Object**:
    - **String** - **account\_alias**, alias of account.
    - **String** - **account\_id**, id of account.
    - **String** - **address**, address of account.
    - **Boolean** - **change**, whether the account address is change.

### Example

List three addresses from first position by **account\_id** or **account\_alias**

### Request

```
curl -X POST http://localhost:9888/list-addresses -d '{"account_alias": "alice",
"account_id": "086KQD75G0A02", "from": 0, "count": 3}'
```

### Response

```
[
  {
    "account_alias": "alice",
    "account_id": "086KQD75G0A02",
    "address": "ey1qcn9lf7nxhswratvmg6d78nq7r7yupm36qgsv55",

```

```

    "change": false
  },
  {
    "account_alias": "alice",
    "account_id": "086KQD75G0A02",
    "address": "ey1qew4h5uvt5ssrtg2alms0j77r94c30m78ucrcxy",
    "change": false
  },
  {
    "account_alias": "alice",
    "account_id": "086KQD75G0A02",
    "address": "ey1qgnp4lte7wge0rsekevjlrdh39vkzz0c2alheue",
    "change": false
  }
]

```

## Validate Address Endpoint

Validate that the address is valid and report if it is local or not.

### Parameters

Object:

- **string** - **address**, address of account.

### Returns

Object:

- **Boolean** - **valid**, whether the account address is valid.
- **Boolean** - **is\_local**, whether the account address is local.

### Example

Request the validity of an address.

#### Request

```

curl -X POST http://localhost:9888/validate-address -d '{"address":
"ey1qcn9lf7nxhswratvmg6d78nq7r7yupm36qgs55"}'

```

#### Response

```

{
  "valid": true,
  "is_local": true,

```

```
}
```

## Get Mining Address Endpoint

Query the current mining address.

### Parameters

None.

### Returns

Object:

- **String** - **mining\_address**, the current mining address being used.

### Example

Request the current mining address.

### Request

```
curl -X POST http://localhost:9888/get-mining-address
```

### Response

```
{
  "mining_address": "ey1qnhr65jq3q9gf8uymza8vp0ew8tfyh642wddxh6"
}
```

## Set Mining Address Endpoint

Set the current mining address, no matter whether the address is a local one or not. It returns an error message if the address format is incorrect.

### Parameters

Object:

- **String** - **mining\_address**, mining address to set.

### Returns

Object:

- **String** - **mining\_address**, the new mining address.

## Example

Update the node's mining address.

### Request

```
curl -X POST http://localhost:9888/set-mining-address -d
'{"mining_address":"ey1qnhr65jq3q9gf8uymza8vp0ew8tfyh642wddxh6"}'
```

### Response

```
{
  "mining_address":"ey1qnhr65jq3q9gf8uymza8vp0ew8tfyh642wddxh6"
}
```

## Get Coinbase Arbitrary Endpoint

Get coinbase arbitrary.

### Parameters

None.

### Returns

Object:

- **String** - **arbitrary**, the arbitrary data append to coinbase, in hexadecimal format. (The full coinbase data for a block will be `0x00&block_height&arbitrary.`)

## Example

Query for the coinbase arbitrary.

### Request

```
curl -X POST http://localhost:9888/get-coinbase-arbitrary
```

### Response

```
{
  "arbitrary":"ff"
}
```

# Set Coinbase Arbitrary Endpoint

Set coinbase arbitrary.

## Parameters

Object:

- **String** - **arbitrary**, the arbitrary data to be appended to coinbase, in hexadecimal format.

## Returns

Object:

- **String** - **arbitrary**, the arbitrary data being appended to coinbase, in hexadecimal format. (The full coinbase data for a block will be `0x008block_height&arbitrary`.)

## Example

Set the coinbase arbitrary.

### Request

```
curl -X POST http://localhost:9888/set-coinbase-arbitrary -d '{"arbitrary":"ff"}
```

### Response

```
{
  "arbitrary":"ff"
}
```

# List **pubkeys** Endpoint

Returns the list of all available **pubkeys** by account.

## Parameters

Object: **account\_alias** | **account\_id** | **public\_key**

Optional:

- **String** - **account\_alias**, alias of account.
- **String** - **account\_id**, id of account.
- **string** - **public\_key**, public key.

## Returns

Object:

- **String** - **root\_xpub**, root xpub.
- **Array of Object** - **pubkey\_infos**, public key array.
  - **String** - **pubkey**, public key.
  - **Object** - **derivation\_path**, derivation path for root xpub.

## Example

Query for the list of **pubkeys** by account ID or account alias.

### Request

```
curl -X POST http://localhost:9888/list-pubkeys -d '{"account_id": "0G00LLUV00A02"}'
```

### Response

```
{
  "pubkey_infos": [
    {
      "derivation_path": [
        "010100000000000000",
        "010000000000000000"
      ],
      "pubkey": "b7730319feac582056379548360da5c08258e248e5c29de08a97a6614df1425d"
    },
    {
      "derivation_path": [
        "010100000000000000",
        "020000000000000000"
      ],
      "pubkey": "5044a0d6113faaf4cb2550f63a820ab579a2af6134e503b76378490d5fe75af4"
    },
    {
      "derivation_path": [
        "010100000000000000",
        "030000000000000000"
      ],
      "pubkey": "ff5c28ce257b25c2a6e172ded490a708a8e654253836d92eb0a68b81ce63bea3"
    }
  ],
  "root_xpub":
  "94a909319eac179f7694b99b8367b9c02b4414b95961e2e3a5bd887e0616af05a7c5e4448df92cd6cdfd8
  2e57cd7aefc1ee0a7fd0d6a2194b5e5faf82556bedc"
}
```

# Create Asset Endpoint

Create an asset definition, it prepares for the issuance of an asset.

## Parameters

Object:

- **String** - **alias**, name of the asset.
- **Object** - **definition**, definition of asset.

Optional:(please pick one from the following two ways)

- **Array of String** - **root\_xpubs**, xpub array.
- **Integer** - **quorum**, the default value is **1**, threshold of keys that must sign a transaction to spend asset units controlled by the account.

or

- **String** - **issuance\_program**, user-defined contract program.

## Returns

Object:

- **String** - **id**, asset id.
- **String** - **alias**, name of the asset.
- **String** - **issuance\_program**, control program of the issuance of asset.
- **Array of Object** - **keys**, information of asset pubkey.
- **String** - **definition**, definition of asset.
- **Integer** - **quorum**, threshold of keys that must sign a transaction to spend asset units controlled by the account.

## Example

Create an asset by **xpubs**:

### Request

```
curl -X POST http://localhost:9888/create-asset -d '{"alias": "GOLD", "root_xpubs": ["f6a16704f745a168642712060e6c5a69866147e21ec2447ae628f87d756bb68cc9b91405ad0a95f004090e864fde472f62ba97053ea109837bc89d63a64040d5"], "quorum":1}'
```

### Response



```
{
  "id": "3c1cf4c9436e3f942cb2f1d70a584f1c61df3697698daccdc89e46f46a003d0",
  "alias": "GOLD",
  "issuance_program":
    "766baa209683b893483c0a5a317bf9868a8e2a09691f8aa8c1f3e2a7bb62b157e76712e05151ad696c00c0",
  "keys": [
    {
      "root_xpub":
        "f6a16704f745a168642712060e6c5a69866147e21ec2447ae628f87d756bb68cc9b91405ad0a95f004090e864fde472f62ba97053ea109837bc89d63a64040d5",
      "asset_pubkey":
        "9683b893483c0a5a317bf9868a8e2a09691f8aa8c1f3e2a7bb62b157e76712e012bd443fa7d56a0627df0a29dffcdc52641672a0f5cba54d104ad76eb8dfc3",
      "asset_derivation_path": [
        "000200000000000000"
      ]
    }
  ],
  "quorum": 1,
  "definition": {}
}
```

Create an asset by `issuance_program`:

## Request

```
curl -X POST http://localhost:9888/create-asset -d '{"alias":
"TESTASSET","issuance_program":
"20e9108d3ca8049800727f6a3505b3a2710dc579405dde03c250f16d9a7e1e6e78160014c5a5b563c4623018557fb299259542b8739f6bc20163201e074b22ed7ae8470c7ba5d8a7bc95e83431a753a17465e8673af68a82500c22741a547a6413000000007b7b51547ac1631a000000547a547aae7cac00c0",
"definition":{"name":"TESTASSET","symbol":"TESTASSET","decimals":8,"description":{}}}'
```

## Response

```
{
  "id": "59621aa82c047bd21f73711d4a7905b7a9fbb49bc1a3fdc309b13807cc8b9094",
  "alias": "TESTASSET",
  "issuance_program":
    "20e9108d3ca8049800727f6a3505b3a2710dc579405dde03c250f16d9a7e1e6e78160014c5a5b563c4623018557fb299259542b8739f6bc20163201e074b22ed7ae8470c7ba5d8a7bc95e83431a753a17465e8673af68a82500c22741a547a6413000000007b7b51547ac1631a000000547a547aae7cac00c0",
  "keys": null,
  "quorum": 0,
  "definition": {
    "decimals": 8,
    "description": {}
  }
}
```

```
"name": "TESTASSET",  
"symbol": "TESTASSET"  
}  
}
```

## Get Asset Endpoint

Query asset details by asset ID.

### Parameters

Object:

- **String** - **id**, id of asset.

### Returns

Object:

- **String** - **id**, asset id.
- **String** - **alias**, name of the asset.
- **String** - **issuance\_program**, control program of the issuance of asset.
- **Integer** - **key\_index**, index of key for xpub.
- **Integer** - **quorum**, threshold of keys that must sign a transaction to spend asset units controlled by the account.
- **Array of Object** - **xpubs**, pubkey array.
- **String** - **type**, type of asset.
- **Integer** - **vm\_version**, version of VM.
- **String** - **raw\_definition\_byte**, byte of asset definition.
- **Object** - **definition**, description of asset.

### Example

Get asset details by asset ID.

#### Request

```
curl -X POST http://localhost:9888/get-asset -d '{"id":  
"50ec80b6bc48073f6aa8fa045131a71213c33f3681203b15ddc2e4b81f1f4730"}'
```

#### Response

```
{
```

```

"alias": "SILVER",
"definition": null,
"id": "50ec80b6bc48073f6aa8fa045131a71213c33f3681203b15ddc2e4b81f1f4730",
"issue_program":
"ae2029cd61d9ef31d40af7541f9a50831d6317fdb0870249d0564fcfa9a8f843589c5151ad",
"key_index": 1,
"quorum": 1,
"raw_definition_byte": "",
"type": "asset",
"vm_version": 1,
"xpubs": [

"34b16ee500615cd325f8b84099f83c1ebecaca67977c5dc9b71ae32ceaf18207f996b0a9725b901d37926
89b2babcb60febe3b81a684d9b56b65f67f307d453d"
]
}

```

## List Assets Endpoint

Returns the list of all available assets.

### Parameters

None.

### Returns

- **Array of Object**, asset array.
  - **Object**:
    - **String** - **id**, asset id.
    - **String** - **alias**, name of the asset.
    - **String** - **issuance\_program**, control program of the issuance of asset.
    - **Integer** - **key\_index**, index of key for xpub.
    - **Integer** - **quorum**, threshold of keys that must sign a transaction to spend asset units controlled by the account.
    - **Array of Object** - **xpubs**, pubkey array.
    - **String** - **type**, type of asset.
    - **Integer** - **vm\_version**, version of VM.
    - **String** - **raw\_definition\_byte**, byte of asset definition.
    - **Object** - **definition**, description of asset.

### Example

List all the available assets.

## Request

```
curl -X POST http://localhost:9888/list-assets -d '{}'
```

## Response

```
[
  {
    "alias": "EY",
    "definition": {
      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "issue_program": "",
    "key_index": 0,
    "quorum": 0,
    "raw_definition_byte":
"7b0a202022646563696d616c73223a20382c0a2020226465736372697074696f6e223a20224279746f6d2
04f6666696369616c204973737565222c0a2020226e616d65223a202262746d222c0a20202273796d626f6
c223a202262746d220a7d",
    "type": "internal",
    "vm_version": 1,
    "xpubs": null
  },
  {
    "alias": "SILVER",
    "definition": null,
    "id": "50ec80b6bc48073f6aa8fa045131a71213c33f3681203b15ddc2e4b81f1f4730",
    "issue_program":
"ae2029cd61d9ef31d40af7541f9a50831d6317fdb0870249d0564fcfa9a8f843589c5151ad",
    "key_index": 1,
    "quorum": 1,
    "raw_definition_byte": "",
    "type": "asset",
    "vm_version": 1,
    "xpubs": [
      "34b16ee500615cd325f8b84099f83c1ebecaca67977c5dc9b71ae32ceaf18207f996b0a9725b901d37926
89b2babcb60febe3b81a684d9b56b65f67f307d453d"
    ]
  }
]
```

# Update Asset Alias Endpoint

Update asset alias by assetID.

## Parameters

Object:

- **String** - **id**, id of asset.
- **String** - **alias**, new alias of asset.

## Returns

Nothing the asset alias is updated successfully.

## Example

Update asset alias.

## Request

```
curl -X POST http://localhost:9888/update-asset-alias -d '{"id":"50ec80b6bc48073f6aa8fa045131a71213c33f3681203b15ddc2e4b81f1f4730", "alias":"GOLD"}'
```

## Response

Nothing if the operation was successful.

# List Balances Endpoint

Returns the list of all available accounts' balances.

## Parameters

Optional:

- **String** - **account\_id**, account id.
- **String** - **account\_alias**, name of account.

## Returns

- **Array of Object**, balances owned by the account.
  - **Object**:
    - **String** - **account\_id**, account id.
    - **String** - **account\_alias**, name of account.

- **String** - **asset\_id**, asset id.
- **String** - **asset\_alias**, name of asset.
- **Integer** - **amount**, specified asset balance of account.

## Example

List all the available accounts' balances.

### Request

```
curl -X POST http://localhost:9888/list-balances -d '{}'
```

### Response

```
[
  {
    "account_alias": "default",
    "account_id": "0BDQ9AP100A02",
    "amount": 3550800000000,
    "asset_alias": "EY",
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffff"
  },
  {
    "account_alias": "alice",
    "account_id": "0BDQARM800A04",
    "amount": 60000000000,
    "asset_alias": "EY",
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffff"
  }
]
```

List available accounts' balances by a given **account\_id**:

### Request

```
curl -X POST http://localhost:9888/list-balances -d '{"account_id":"0BDQ9AP100A02"}'
```

### Response

```
[
  {
    "account_alias": "default",
    "account_id": "0BDQ9AP100A02",
    "amount": 3550800000000,
    "asset_alias": "EY",
```

```
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff"
  }
]
```

## List Unspent Outputs Endpoint

Returns the sub list of all available unspent outputs for all accounts in your wallet.

### Parameters

Object:

Optional:

- **String** - **id**, id of unspent output.
- **Boolean** - **unconfirmed**, is include unconfirmed **utxo**
- **Boolean** - **smart\_contract**, is contract **utxo**
- **Integer** - **from**, the start position of first **utxo**
- **Integer** - **count**, the number of returned
- **String** - **account\_id**, account id.
- **String** - **account\_alias**, name of account.

### Returns

- **Array of Object**, unspent output array.
  - **Object**:
    - **String** - **account\_id**, account id.
    - **String** - **account\_alias**, name of account.
    - **String** - **asset\_id**, asset id.
    - **String** - **asset\_alias**, name of asset.
    - **Integer** - **amount**, specified asset balance of account.
    - **String** - **address**, address of account.
    - **Boolean** - **change**, whether the account address is change.
    - **String** - **id**, unspent output id.
    - **String** - **program**, program of account.
    - **String** - **control\_program\_index**, index of program.
    - **String** - **source\_id**, source unspent output id.
    - **String** - **source\_pos**, position of source unspent output id in block.
    - **String** - **valid\_height**, valid height.

## Example

List all the available unspent outputs:

### Request

```
curl -X POST http://localhost:9888/list-unspent-outputs -d '{}'
```

### Response

```
[
  {
    "account_alias": "alice",
    "account_id": "0BKBR6VR00A06",
    "address": "ey1qv3htuvug7qdv46ywcvvzytrwrsyg0swltfa0dm",
    "amount": 2000,
    "asset_alias": "GOLD",
    "asset_id": "1883cce6aab82cf9af8cd085a3115dd4a92cdb8e6a9152acd73d7ae4adb9030a",
    "change": false,
    "control_program_index": 2,
    "id": "58f29f0f85f7bd2a91088bcbe536dee41cd0642dfb1480d3a88589bdbfd642d9",
    "program": "0014646ebe3388f01acae88ec318222c6e1c0887c1df",
    "source_id": "5988c1630c1f325e69bb92cb4b19af14286aa107311bc64b8f1a54629a33e0f4",
    "source_pos": 2,
    "valid_height": 0
  },
  {
    "account_alias": "default",
    "account_id": "0BKBR2D2G0A02",
    "address": "ey1qx7ylnhszg24995d5e0nftu9e87kt9vnxcn633r",
    "amount": 624000000000,
    "asset_alias": "EY",
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "change": false,
    "control_program_index": 12,
    "id": "5af9d3c9b69470983377c1fc0c9125c4ac3bfd32c8d505f2a6042aade8503bc9",
    "program": "00143789f9de0242aa52d1b4cbe695f0b93facb2b266",
    "source_id": "233d1dd49e591980f98e11f333c6c28a867e78448e272011f045131df5aa260b",
    "source_pos": 0,
    "valid_height": 12
  }
]
```

List the unspent output matching the given id:

### Request

```
curl -X POST http://localhost:9888/list-unspent-outputs -d '{"id":
```



```
"58f29f0f85f7bd2a91088bcbe536dee41cd0642dfb1480d3a88589bdbfd642d9"}'
```

## Response

```
{
  "account_alias": "alice",
  "account_id": "0BKBR6VR00A06",
  "address": "ey1qv3htuvug7qdv46ywcvvzytrwsyg0swltfa0dm",
  "amount": 2000,
  "asset_alias": "GOLD",
  "asset_id": "1883cce6aab82cf9af8cd085a3115dd4a92cdb8e6a9152acd73d7ae4adb9030a",
  "change": false,
  "control_program_index": 2,
  "id": "58f29f0f85f7bd2a91088bcbe536dee41cd0642dfb1480d3a88589bdbfd642d9",
  "program": "0014646ebe3388f01acae88ec318222c6e1c0887c1df",
  "source_id": "5988c1630c1f325e69bb92cb4b19af14286aa107311bc64b8f1a54629a33e0f4",
  "source_pos": 2,
  "valid_height": 0
}
```

## Backup Wallet Endpoint

Backs up a wallet to an image file, it contains the accounts' image, the assets' image and the keys' image.

### Parameters

None.

### Returns

Object:

- Object - **account\_image**, account image.
- Object - **asset\_image**, asset image.
- Object - **key\_images**, key image.

### Example

Request a backup of the node's wallet information.

### Request

```
curl -X http://localhost:9888/backup-wallet -d '{}'
```

## Response

```
{
  "account_image": {
    "slices": [
      {
        "account": {
          "type": "account",
          "xpubs": [
            "395d6e0ac25978c3f52f9c7bdfdf75ce6af02639fd7875b4b1f40778ab1120c6dcf461b7ab6fd310983afb54a9a0fb3e09b6ec0d4364c4808c94383d50fb0681"
          ],
          "quorum": 1,
          "key_index": 1,
          "ID": "0CQTA3EOG0A02",
          "Alias": "def"
        },
        "contract_index": 2
      }
    ]
  },
  "asset_image": {
    "assets": []
  },
  "key_images": {
    "xkeys": [
      {
        "crypto": {
          "cipher": "aes-128-ctr",
          "ciphertext": "bf44766fec149478af9500e25ce0a6bc50bb2fa04e40465781da6ff64e9b3a4c9af3d214cd92c5a41d8498db5f4376526740f960ff429b16e52876aec6860e1d",
          "cipherparams": {
            "iv": "1b0fc61ae4dacb15f0f77d2b4ba67635"
          },
          "kdf": "scrypt",
          "kdfparams": {
            "dklen": 32,
            "n": 4096,
            "p": 6,
            "r": 8,
            "salt": "e133b1e7caae771ff1ab34b14824d6e27ef399f2b7ded4ad3500f080ede4a1dd"
          },
          "mac": "bc6bf411fb63e61a17bc15b94f29cf0d5a0f084c328955da1f7e2b26757cfc23"
        },
        "id": "1f40be59-7400-4fdc-b46b-15009f65363a",
        "type": "eiyaro_kd",
        "version": 1,
        "alias": "default",
        "xpub":
```

```

"c4ec9bfd5df19d175e17ff7fed89193c37a4a64e1c0928387da01387ca76c3bfd99390e3373ec4d438522
cc2d4644214cd2ec3b00965f7a1fa3546809583191c"
},
{
  "crypto": {
    "cipher": "aes-128-ctr",
    "ciphertext":
"f0887c8603cbbafc0a66d5b45f71488e089708c7dea4342625a67858a49d6d08c79cd3f1800627e3c8b46
68e8df34fcf0be9df5d9d4503acff05373976c312a9",
    "cipherparams": {
      "iv": "c111b46f9104f49f2c40aedb827e53b5"
    },
    "kdf": "scrypt",
    "kdfparams": {
      "dklen": 32,
      "n": 4096,
      "p": 6,
      "r": 8,
      "salt": "d9ef588b258b111dea1d99a4e4c5a4f968ab69072176bb95b111922e3bbea9e6"
    },
    "mac": "336f5fee643776e139f05ebe5e4f209d992ff97e16b906105fadac9e86133554"
  },
  "id": "611d407c-9e97-4297-a02a-13cd68e47983",
  "type": "eiyaro_kd",
  "version": 1,
  "alias": "def",
  "xpub":
"395d6e0ac25978c3f52f9c7bdfdf75ce6af02639fd7875b4b1f40778ab1120c6dcf461b7ab6fd310983af
b54a9a0fb3e09b6ec0d4364c4808c94383d50fb0681"
}
]
}
}

```

## Restore Wallet Endpoint

Restores the wallet by image file.

### Parameters

Object:

- Object - **account\_image**, account image.
- Object - **asset\_image**, asset image.
- Object - **key\_images**, key image.

## Returns

Nothing if the operation was successful.

## Example

Restore a node's wallet via the image file.

### Request

```
curl -X POST http://localhost:9888/restore-wallet -d
'{"account_image":{"slices":[{"account":{"type":"account","xpubs":["395d6e0ac25978c3f5
2f9c7bdfdf75ce6af02639fd7875b4b1f40778ab1120c6dcf461b7ab6fd310983afb54a9a0fb3e09b6ec0d
4364c4808c94383d50fb0681"],"quorum":1,"key_index":1,"ID":"0CQTA3E0G0A02","Alias":"def"
},"contract_index":2}]},{"asset_image":{"assets":[]},"key_images":{"xkeys":[{"crypto":{"
cipher":"aes-128-
ctr","ciphertext":"bf44766fec149478af9500e25ce0a6bc50bb2fa04e40465781da6ff64e9b3a4c9af
3d214cd92c5a41d8498db5f4376526740f960ff429b16e52876aec6860e1d"},"cipherparams":{"iv":"1
b0fc61ae4dacb15f0f77d2b4ba67635"},"kdf":"scrypt","kdfparams":{"dklen":32,"n":4096,"p":
6,"r":8,"salt":"e133b1e7caae771ff1ab34b14824d6e27ef399f2b7ded4ad3500f080ede4a1dd"},"ma
c":"bc6bf411fb63e61a17bc15b94f29cf0d5a0f084c328955da1f7e2b26757cfc23"},"id":"1f40be59-
7400-4fdc-b46b-
15009f65363a"},"type":"eiyaro_kd","version":1,"alias":"default","xpub":"c4ec9bfd5df19d1
75e17ff7fed89193c37a4a64e1c0928387da01387ca76c3bfd99390e3373ec4d438522cc2d4644214cd2ec
3b00965f7a1fa3546809583191c"}],"crypto":{"cipher":"aes-128-
ctr","ciphertext":"f0887c8603cbbafc0a66d5b45f71488e089708c7dea4342625a67858a49d6d08c79
cd3f1800627e3c8b4668e8df34fcf0be9df5d9d4503acff05373976c312a9"},"cipherparams":{"iv":"c
111b46f9104f49f2c40aedb827e53b5"},"kdf":"scrypt","kdfparams":{"dklen":32,"n":4096,"p":
6,"r":8,"salt":"d9ef588b258b111dea1d99a4e4c5a4f968ab69072176bb95b111922e3bbea9e6"},"ma
c":"336f5fee643776e139f05ebe5e4f209d992ff97e16b906105fadac9e86133554"},"id":"611d407c-
9e97-4297-a02a-
13cd68e47983"},"type":"eiyaro_kd","version":1,"alias":"def","xpub":"395d6e0ac25978c3f52
f9c7bdfdf75ce6af02639fd7875b4b1f40778ab1120c6dcf461b7ab6fd310983afb54a9a0fb3e09b6ec0d4
364c4808c94383d50fb0681"}]]}'
```

### Response

Nothing if the operation was successful.

## Rescan Wallet Endpoint

Trigger a rescan of the block information on the wallet.

### Parameters

None.

## Returns

Nothing if operation was a success.

## Example

Request a rescan of the block information on the node.

### Request

```
curl -X POST http://localhost:9888/rescan-wallet -d '{}'
```

### Response

Nothing if the operation was successful.

## Recovery Wallet Endpoint

Recovers a wallet and it's accounts from root **xpubs**.

All accounts and balances of **bip44** multi-account hierarchy for deterministic wallets can be restored via root **xpubs**.

## Parameters

**Object:**

- **Object** - **xpubs**, root XPubs.

## Returns

Status of recovery wallet operation.

## Example

Request a wallet's recovery via **xpubs**.

### Request

```
curl -X POST http://localhost:9888/recovery-wallet -d '{"xpubs":["c536a2c11fafd8278e02e9393dcbf5aa420eb51a1761a7e5da7f2b9b37969b52a8f8e2b692e7dcacaf79dfa0d1e28c63eb9fda42942f20feaa8a71b383d9a4668c"]}'
```

### Response

```
{  
  "status": "success"  
}
```

```
}
```

## Wallet Info Endpoint

Returns the wallet's information.

### Parameters

None.

### Returns

Object:

- **Integer** - **best\_block\_height**, current block height.
- **Integer** - **wallet\_height**, current block height for wallet.

### Example

Request the node's wallet information.

#### Request

```
curl -X POST http://localhost:9888/wallet-info -d '{}'
```

#### Response

```
{
  "best_block_height": 150,
  "wallet_height": 150
}
```

## Sign Message Endpoint

Sign a message with the key password(decode encrypted private key) of an address.

### Parameters

Object:

- **String** - **address**, address for account.
- **String** - **message**, message for signature by address xpub.
- **String** - **password**, password of account.

## Returns

Object:

- **String** - **derived\_xpub**, derived xpub.
- **String** - **signature**, signature of message.

## Example

Request the signature of a message by an address' private key.

### Request

```
curl -X POST http://localhost:9888/sign-message -d
'{"address":"eyJx2qgvvjz734ur8x5lpfdtlau74aaa5djs0a5jn", "message":"this is a test
message", "password":"123456"}'
```

### Response

```
{
  "signature":
  "74da3d6572233736e3a439166719244dab57dd0047f8751b1efa2da26eeab251d915c1211dcad77e8b013
  267b86d96e91ae67ff0be520ef4ec326e911410b609",
  "derived_xpub":
  "6ff8c3d1321ce39a3c3550f57ba70b67dcbcef821e9b85f6150edb7f2f3f91009e67f3075e6e76ed5f657
  ee4b1a5f4749b7a8c74c8e7e6a1b0e5918ebd5df4d0"
}
```

## Decode Program Endpoint

Decode a program.

### Parameters

Object:

- **String** - **program**, program for account.

## Returns

Object:

- **String** - **instructions**, instructions and data for program.

## Example

Request to have a program decoded into it's instructions.

## Request

```
curl -X POST http://localhost:9888/decode-program -d
'{"program":"0014a86c83ee12e6d790fb388345cc2e2b87056a0773"}'
```

## Response

```
{
  "instructions": "DUP \nHASH160 \nDATA_20 a86c83ee12e6d790fb388345cc2e2b87056a0773
\nEQUALVERIFY \nTXSIGHASH \nSWAP \nCHECKSIG \n"
}
```

# Get Transaction Endpoint

Query the account related transaction by transaction ID.

## Parameters

Object:

- **String** - **tx\_id**, transaction id, hash of transaction.

## Returns

Object:

- **String** - **tx\_id**, transaction id, hash of the transaction.
- **Integer** - **block\_time**, the unix timestamp for when the request was responded.
- **String** - **block\_hash**, hash of the block where this transaction was in.
- **Integer** - **block\_height**, block height where this transaction was in.
- **Integer** - **block\_index**, position of the transaction in the block.
- **Integer** - **block\_transactions\_count**, transactions count where this transaction was in the block.
- **Boolean** - **status\_fail**, whether the state of the transaction request has failed.
- **Integer** - **size**, size of transaction.
- **Array of Object** - **inputs**, object of inputs for the transaction.
  - **String** - **type**, the type of input action, available option include: 'spend', 'issue', 'coinbase'.
  - **String** - **asset\_id**, asset id.
  - **String** - **asset\_alias**, name of asset.
  - **Object** - **asset\_definition**, definition of asset(json object).
  - **Integer** - **amount**, amount of asset.
  - **Object** - **issuance\_program**, issuance program, it only exist when type is 'issue'.



- **Object** - **control\_program**, control program of account, it only exist when type is 'spend'.
- **String** - **address**, address of account, it only exist when type is 'spend'.
- **String** - **spent\_output\_id**, the front of outputID to be spent in this input, it only exist when type is 'spend'.
- **String** - **account\_id**, account id.
- **String** - **account\_alias**, name of account.
- **Object** - **arbitrary**, arbitrary infomation can be set by miner, it only exist when type is 'coinbase'.
- **String** - **input\_id**, hash of input action.
- **Array of String** - **witness\_arguments**, witness arguments.
- **Array of Object** - **outputs**, object of outputs for the transaction.
  - **String** - **type**, the type of output action, available option include: 'retire', 'control'.
  - **String** - **id**, outputid related to utxo.
  - **Integer** - **position**, position of outputs.
  - **String** - **asset\_id**, asset id.
  - **String** - **asset\_alias**, name of asset.
  - **Object** - **asset\_definition**, definition of asset(json object).
  - **Integer** - **amount**, amount of asset.
  - **String** - **account\_id**, account id.
  - **String** - **account\_alias**, name of account.
  - **Object** - **control\_program**, control program of account.
  - **String** - **address**, address of account.

## Example

Retrieve a transaction by it ID.

### Request

```
curl -X POST http://localhost:9888/get-transaction -d '{"tx_id":
"15b8d66e227feff47b3de0f278934ea16d6c828371ec6c13c8f84713dd11703b"}'
```

### Response

```
{
  "block_hash": "1fa9bb389cf974a9b37b63ca38c0cf3453c30f394b9e8ae7f04f2d1b52c329b4",
  "block_height": 530,
  "block_index": 1,
  "block_time": 1528772056,
  "block_transactions_count": 2,
```

```

"inputs": [
  {
    "account_alias": "default",
    "account_id": "0ER7MEFGG0A02",
    "address": "sy1q4pkg8msjumtep7ecsdzuct3tsuzk5pnm3p8nr",
    "amount": 41250000000,
    "asset_alias": "EY",
    "asset_definition": {
      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014a86c83ee12e6d790fb388345cc2e2b87056a0773",
    "input_id": "02702fe116e052aaf4473b034ed40720bfb3aba77df64625311ca3947d367336",
    "spent_output_id":
"002025b727148d04197cc7b9cf7eafd9986041f07641ca82dc0a1d9e227b52f6",
    "type": "spend",
    "witness_arguments": [
      "944a35f256a49712f95319743671152b12360df859deedbfa9f37f9fe6a81b5ff2dce36d9ee6fc19e8be8
b1dd5915719d4341f66f5569aad26283859d3c1bc05",
      "bedfd27f48007c59555da672b6207ac997add62241894ff181bb9d8cba3b7e25"
    ]
  }
],
"outputs": [
  {
    "account_alias": "default",
    "account_id": "0ER7MEFGG0A02",
    "address": "sy1qmt6jxrr8etssufr8qp98emyaly3lknxyndh5cj",
    "amount": 29450000000,
    "asset_alias": "EY",
    "asset_definition": {
      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014daf5230c67cae10e2467004a7cec9df923fb4cc4",
    "id": "35a46dd36eb27b1ffdfdefbe5366175b6325e8f56e5bc3dd2aa1a47197e26e6c",
    "position": 0,
    "type": "control"
  },
  {
    "account_alias": "alice",
    "account_id": "0ER70AK400A02",
    "address": "sy1qxe4jwhkekgnxkezu7xutu5gqnnpmc8ppq98me",
    "amount": 11700000000,

```

```

    "asset_alias": "EY",
    "asset_definition": {
      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014366b275ed9b2266b645cf1b8be51009cc3b260e1",
    "id": "ae791bbde0cc5b370e28a505933b85082d67be8db81bdcc56b8202f200b883e7",
    "position": 1,
    "type": "control"
  }
],
"size": 332,
"status_fail": false,
"tx_id": "15b8d66e227feff47b3de0f278934ea16d6c828371ec6c13c8f84713dd11703b"
}

```

## List Transactions Endpoint

Returns the sub list of all the account related transactions.

### Parameters

Object:

Optional:

- **String** - **id**, transaction id, hash of transaction.
- **String** - **account\_id**, id of account.
- **Boolean** - **detail** , flag of detail transactions, default false (only return transaction summary)
- **Boolean** - **unconfirmed**, flag of unconfirmed transactions(query result include all confirmed and unconfirmed transactions), default false.
- **Integer** - **from**, the start position of first transaction
- **Integer** - **count**, the number of returned

### Returns

Array of Object, transaction array.

Optional:

- **Object**:(summary transaction)
  - **String** - **tx\_id**, transaction id, hash of the transaction.
  - **Integer** - **block\_time**, the unix timestamp for when the request was responded.

- **Array of Object - inputs**, object of summary inputs for the transaction.
  - **String - type**, the type of input action, available option include: 'spend', 'issue', 'coinbase'.
  - **String - asset\_id**, asset id.
  - **String - asset\_alias**, name of asset.
  - **Integer - amount**, amount of asset.
  - **String - account\_id**, account id.
  - **String - account\_alias**, name of account.
  - **Object - arbitrary**, arbitrary information can be set by miner, it only exist when type is 'coinbase'.
- **Array of Object - outputs**, object of summary outputs for the transaction.
  - **String - type**, the type of output action, available option include: 'retire', 'control'.
  - **String - asset\_id**, asset id.
  - **String - asset\_alias**, name of asset.
  - **Integer - amount**, amount of asset.
  - **String - account\_id**, account id.
  - **String - account\_alias**, name of account.
  - **Object - arbitrary**, arbitrary information can be set by miner, it only exist when type is input 'coinbase'(this place is empty).
- **Object:(detail transaction)**
  - **String - tx\_id**, transaction id, hash of the transaction.
  - **Integer - block\_time**, the unix timestamp for when the request was responded.
  - **String - block\_hash**, hash of the block where this transaction was in.
  - **Integer - block\_height**, block height where this transaction was in.
  - **Integer - block\_index**, position of the transaction in the block.
  - **Integer - block\_transactions\_count**, transactions count where this transaction was in the block.
  - **Boolean - status\_fail**, whether the state of the transaction request has failed.
  - **Integer - size**, size of transaction.
  - **Array of Object - inputs**, object of inputs for the transaction.
    - **String - type**, the type of input action, available option include: 'spend', 'issue', 'coinbase'.
    - **String - asset\_id**, asset id.
    - **String - asset\_alias**, name of asset.
    - **Object - asset\_definition**, definition of asset(json object).
    - **Integer - amount**, amount of asset.
    - **Object - issuance\_program**, issuance program, it only exist when type is 'issue'.

- **Object** - **control\_program**, control program of account, it only exist when type is 'spend'.
- **String** - **address**, address of account, it only exist when type is 'spend'.
- **String** - **spent\_output\_id**, the front of outputID to be spent in this input, it only exist when type is 'spend'.
- **String** - **account\_id**, account id.
- **String** - **account\_alias**, name of account.
- **Object** - **arbitrary**, arbitrary information can be set by miner, it only exist when type is 'coinbase'.
- **String** - **input\_id**, hash of input action.
- **Array of String** - **witness\_arguments**, witness arguments.
- **Array of Object** - **outputs**, object of outputs for the transaction.
  - **String** - **type**, the type of output action, available option include: 'retire', 'control'.
  - **String** - **id**, outputid related to utxo.
  - **Integer** - **position**, position of outputs.
  - **String** - **asset\_id**, asset id.
  - **String** - **asset\_alias**, name of asset.
  - **Object** - **asset\_definition**, definition of asset(json object).
  - **Integer** - **amount**, amount of asset.
  - **String** - **account\_id**, account id.
  - **String** - **account\_alias**, name of account.
  - **Object** - **control\_program**, control program of account.
  - **String** - **address**, address of account.

## Example

List all the available transactions:

### Request

```
curl -X POST http://localhost:9888/list-transactions -d '{}'
```

### Response

```
[
  {
    "block_time": 1521771059,
    "inputs": [
      {
        "arbitrary": "06",
        "asset_id":
```

```

"0000000000000000000000000000000000000000000000000000000000000000",
  "type": "coinbase"
},
],
"outputs": [
  {
    "account_alias": "default",
    "account_id": "0BMHBOBVG0A02",
    "amount": 4125000000,
    "asset_alias": "EY",
    "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "type": "control"
  }
],
"tx_id": "c631a8de401913a512c338bcf4a61cb2de6cede12a7385d9d11637eaa6578f33"
},
{
  "block_time": 1521770515,
  "inputs": [
    {
      "account_alias": "default",
      "account_id": "0BMHBOBVG0A02",
      "amount": 4125000000,
      "asset_alias": "EY",
      "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
      "type": "spend"
    }
  ],
  "outputs": [
    {
      "account_alias": "default",
      "account_id": "0BMHBOBVG0A02",
      "amount": 3464950000,
      "asset_alias": "EY",
      "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
      "type": "control"
    },
    {
      "account_alias": "alice",
      "account_id": "0BMHDI1P00A04",
      "amount": 6600000000,
      "asset_alias": "EY",
      "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
      "type": "control"
    }
  ],
  "tx_id": "1151ce5c7b32b8755b5e48109ec7ed956fb1783eaea9558bf5a2ad957825e4b7"
}

```

```
}  
]
```

List the transaction matching the given `tx_id` with detail:

## Request

```
curl -X POST http://localhost:9888/list-transactions -d '{"id":  
"7e9f9b999381da936e3cae48b5bac2b9bc28bb56c6c862be6c110448f7e2f6b3","detail": true}'
```

## Response

```
[  
  {  
    "block_hash": "1b2d0efa025256603e9330273d37f5a900cd3dfb213e015ac53cf645e2315a6d",  
    "block_height": 72,  
    "block_index": 1,  
    "block_time": 1528528584,  
    "block_transactions_count": 2,  
    "inputs": [  
      {  
        "account_alias": "default",  
        "account_id": "0ER7MEFGG0A02",  
        "address": "sy1q4pkg8msjumtep7ecsdzuct3tsuzk5pnm3p8nr",  
        "amount": 41250000000,  
        "asset_alias": "EY",  
        "asset_definition": {  
          "decimals": 8,  
          "description": "Eiyaro Official Issue",  
          "name": "EY",  
          "symbol": "EY"  
        },  
        "asset_id":  
        "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",  
        "control_program": "0014a86c83ee12e6d790fb388345cc2e2b87056a0773",  
        "input_id":  
        "adcef046c3f61fb6ba0d6a7107122f6e31cd4b49c7a3b05aa3391e5b0529d69a",  
        "spent_output_id":  
        "0072a2c1cee30a7c7b7b006ca08a48c2b479bc81c0ec6463fe4865ef37626ab6",  
        "type": "spend",  
        "witness_arguments": [  
          "944a35f256a49712f95319743671152b12360df859deedbfa9f37f9fe6a81b5ff2dce36d9ee6fc19e8be8  
          b1dd5915719d4341f66f5569aad26283859d3c1bc05",  
          "bedfd27f48007c59555da672b6207ac997add62241894ff181bb9d8cba3b7e25"  
        ]  
      }  
    ],  
  }  
],
```

```

"outputs": [
  {
    "account_alias": "default",
    "account_id": "0ER7MEFGG0A02",
    "address": "sy1qskj096x5w7ejcmk746g3djmV84dpXts62dewvd",
    "amount": 34649500000,
    "asset_alias": "EY",
    "asset_definition": {
      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "asset_id":
    "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "001485a4f2e8d477b32c6edae9116cb6c3d5a132e1a",
    "id": "b08c9bfc816064ca33da8b569998229774fc9552da7d4f16870b2c5a8f645b3b",
    "position": 0,
    "type": "control"
  },
  {
    "account_alias": "alice",
    "account_id": "0ER70AK400A02",
    "address": "sy1qxe4jwhkekgnxkezu7xutu5gqnnpmYc8ppq98me",
    "amount": 66000000000,
    "asset_alias": "EY",
    "asset_definition": {
      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "asset_id":
    "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014366b275ed9b2266b645cf1b8be51009cc3b260e1",
    "id": "0e8f8dc83a39b2b6d00a77759a797102d047f82f800fe21f5b1d80bb4d5e2e39",
    "position": 1,
    "type": "control"
  }
],
"size": 333,
"status_fail": false,
"tx_id": "7e9f9b999381da936e3cae48b5bac2b9bc28bb56c6c862be6c110448f7e2f6b3"
}
]

```

List the transaction matching the given `account_id` and unconfirmed flag(unconfirmed transaction's `block_hash`, `block_height` and `block_index` is default for zero):



## Request

```
curl -X POST http://localhost:9888/list-transactions -d '{"account_id":  
"0F1MQVI500A02", "unconfirmed": true, "detail": true}'
```

## Response

```
[  
  {  
    "block_hash": "0000000000000000000000000000000000000000000000000000000000000000",  
    "block_height": 0,  
    "block_index": 0,  
    "block_time": 1529032899,  
    "inputs": [  
      {  
        "account_alias": "default",  
        "account_id": "0F1L5Q3V00A02",  
        "address": "sy1ql67n04pj8mfqzv3wj8num3yrltdykemgrr45j",  
        "amount": 41250000000,  
        "asset_alias": "EY",  
        "asset_definition": {  
          "decimals": 8,  
          "description": "Eiyaro Official Issue",  
          "name": "EY",  
          "symbol": "EY"  
        },  
        "asset_id":  
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",  
        "control_program": "0014febd37d4323ed201322e900f3e6e241fd6d25b3b",  
        "input_id":  
"192ac93bad580cd53626b7f11c17e6eca64f66d1947add13a5620b78f666693e",  
        "spent_output_id":  
"00570443cbac4f68638ff565e8b04db2062800b9e23b7701913ddf6b190dbe65",  
        "type": "spend",  
        "witness_arguments": [  
          "512a2b60324433de96cd4274bd298b4b109a29c4d9d68582952065dfd0d7c00663cbc49e8e42fdef740a7  
e1b78622ee31abf2e9b0d5609755f275afd6751590b",  
          "bedfd27f48007c59555da672b6207ac997add62241894ff181bb9d8cba3b7e25"  
        ]  
      },  
      {  
        "account_alias": "default",  
        "account_id": "0F1L5Q3V00A02",  
        "address": "sy1ql67n04pj8mfqzv3wj8num3yrltdykemgrr45j",  
        "amount": 41250000000,  
        "asset_alias": "EY",  
        "asset_definition": {  
          "decimals": 8,  

```

```

        "description": "Eiyaro Official Issue",
        "name": "EY",
        "symbol": "EY"
    },
    "asset_id":
    "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014febd37d4323ed201322e900f3e6e241fd6d25b3b",
    "input_id":
    "83713c02b52eb18f782de67b322c43571d83793e082596b6410e2d3a8a41387d",
    "spent_output_id":
    "01df9011ca0bed4bb9b95dc84da4c5103fed06ca28c03d92d34ee3d61b945288",
    "type": "spend",
    "witness_arguments": [

    "512a2b60324433de96cd4274bd298b4b109a29c4d9d68582952065dfd0d7c00663cbc49e8e42fdef740a7
    e1b78622ee31abf2e9b0d5609755f275afd6751590b",
        "bedfd27f48007c59555da672b6207ac997add62241894ff181bb9d8cba3b7e25"
    ]
    }
],
"outputs": [
    {
        "account_alias": "default",
        "account_id": "0F1L5Q3V00A02",
        "address": "sy1qdcfprk7wjy6flavkzhcjh3dxyrwl935trrs5m",
        "amount": 41249100000,
        "asset_alias": "EY",
        "asset_definition": {
            "decimals": 8,
            "description": "Eiyaro Official Issue",
            "name": "EY",
            "symbol": "EY"
        },
        "asset_id":
        "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
        "control_program": "00146e1211dbce91349ff59615f12bc5a620ddfd9634",
        "id": "09fabb1a2bac44c45054175453e23e81a764557147523d8df70d8a190cf2eb17",
        "position": 0,
        "type": "control"
    },
    {
        "account_alias": "default",
        "account_id": "0F1L5Q3V00A02",
        "address": "sy1qt92xx2f4ys63dyhy58jle87nttcf37zftweklh",
        "amount": 39150000000,
        "asset_alias": "EY",
        "asset_definition": {
            "decimals": 8,
            "description": "Eiyaro Official Issue",
            "name": "EY",
            "symbol": "EY"
        }
    }
]

```

```

    },
    "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014595463293524351692e4a1e5fc9fd35af098f849",
    "id": "6efae48663e872193e8a672eb85b8bbf29d8aee98e42816340fa0b2340cc355d",
    "position": 1,
    "type": "control"
  },
  {
    "account_alias": "alice",
    "account_id": "0F1MQVI500A02",
    "address": "sy1qum6ly8aq9u9k7xrkuck9pq64xg67gw40khnnxu",
    "amount": 2100000000,
    "asset_alias": "EY",
    "asset_definition": {
      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014e6f5f21fa02f0b6f1876e62c5083553235e43aaf",
    "id": "aca1ecc59d8bcf548e4f5afb8a97e38f0eb56e1387b17400fd3c693c074a703d",
    "position": 2,
    "type": "control"
  }
],
"size": 1194,
"status_fail": false,
"tx_id": "9c28a6a2a039ed5bdebe81eea44cdb22a951c472bc25cb1e8188ae423a98f251"
},
{
  "block_hash": "474b9c28b225fba02278ad3b097d561bf8f5c562ff2a548226fc10fc1d75b7ed",
  "block_height": 255,
  "block_index": 1,
  "block_time": 1528963126,
  "block_transactions_count": 2,
  "inputs": [
    {
      "account_alias": "alice",
      "account_id": "0F1MQVI500A02",
      "address": "sy1qum6ly8aq9u9k7xrkuck9pq64xg67gw40khnnxu",
      "amount": 10000000000,
      "asset_alias": "EY",
      "asset_definition": {
        "decimals": 8,
        "description": "Eiyaro Official Issue",
        "name": "EY",
        "symbol": "EY"
      },
    },
  ],

```

```

      "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
      "control_program": "0014e6f5f21fa02f0b6f1876e62c5083553235e43aaf",
      "input_id":
"0705bb7f4aea4ef869f22ab5e4a26e051b066e41290c1b74734a82aee8c03dfc",
      "spent_output_id":
"767649aafdfe2c22d46d641a5b74d934e2590330f7280b0fc55b978812a99a58",
      "type": "spend",
      "witness_arguments": [

"a4d4f09a04371516d37e1d27f92c9cb41e4b1e7f62762cf23ed3904a9dfd2d794195862fffd00bf7ac373
e5891c8d2eb660dc5ff9c040ec4e01f973bbfd31c23",
      "2ecb3f55bfde18ec95a93c456dd3d44cb55da83148a68cbc059ea04e7b12d3bc"
    ]
  },
  {
    "account_alias": "alice",
    "account_id": "0F1MQVI500A02",
    "address": "sy1qum6ly8aq9u9k7xrkuck9pq64xg67gw40khnnxu",
    "amount": 1000000000000,
    "asset_alias": "GOLD",
    "asset_definition": {
      "decimals": 8,
      "description": {},
      "name": "",
      "symbol": ""
    },
    "asset_id":
"71deb74415f16a1f7bffb04c61d427bb1f93adfbfa257ffba2673f102d602e78f",
    "control_program": "0014e6f5f21fa02f0b6f1876e62c5083553235e43aaf",
    "input_id":
"35764d80217d0d2a3c1b000dc2dd47cf0c8bc152c842ce6e3a7783140087d3d6",
    "spent_output_id":
"5d7a88851f5696ded279cb9bc380e050024c555258ea7851dfdedc2797b0d820",
    "type": "spend",
    "witness_arguments": [

"a4d4f09a04371516d37e1d27f92c9cb41e4b1e7f62762cf23ed3904a9dfd2d794195862fffd00bf7ac373
e5891c8d2eb660dc5ff9c040ec4e01f973bbfd31c23",
      "2ecb3f55bfde18ec95a93c456dd3d44cb55da83148a68cbc059ea04e7b12d3bc"
    ]
  }
],
"outputs": [
  {
    "account_alias": "alice",
    "account_id": "0F1MQVI500A02",
    "address": "sy1q39sztlh4jq5nknstn2udvvp6v5ugussx2dj0",
    "amount": 9980000000,
    "asset_alias": "EY",
    "asset_definition": {

```

```

      "decimals": 8,
      "description": "Eiyaro Official Issue",
      "name": "EY",
      "symbol": "EY"
    },
    "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014896025fef590293b4e0b9ab8d6303bd329c47210",
    "id": "2b44969d28d79544006e792411d6cd1d245f9af20419f6138494b4b5aac2a72e",
    "position": 0,
    "type": "control"
  },
  {
    "account_alias": "alice",
    "account_id": "0F1MQVI500A02",
    "address": "sy1q258yd0gvatje4pn0qc8z9w8cdv45j9tvhfpjh8",
    "amount": 999999999901,
    "asset_alias": "GOLD",
    "asset_definition": {
      "decimals": 8,
      "description": {},
      "name": "",
      "symbol": ""
    },
    "asset_id":
"71deb74415f16a1f7bffb04c61d427bb1f93adfbfa257ffba2673f102d602e78f",
    "control_program": "0014550e46bd0ceae59a866f060e22b8f86b2b49156c",
    "id": "54be1bc876d1deccb9845acac79eabf62d7eacd5935e337850233657914d0f9d",
    "position": 1,
    "type": "control"
  },
  {
    "amount": 99,
    "asset_alias": "GOLD",
    "asset_definition": {
      "decimals": 8,
      "description": {},
      "name": "",
      "symbol": ""
    },
    "asset_id":
"71deb74415f16a1f7bffb04c61d427bb1f93adfbfa257ffba2673f102d602e78f",
    "control_program":
"20e864761d8181103b6476435a805cba97361df9a05c40fae644c27f69ce045d3c16001464d928e181900
d382fa33def66534c7323c778c4015820684d6683d014abb4e019878b50fbbb547bcbf9c4739498d8eeef5
65d37f9a82f741a547a6413000000007b7b51547ac1631a000000547a547aae7cac00c0",
    "id": "347553923bb550c236a703e46600d53f25161e3eb74ee3183884d398e5d894b0",
    "position": 2,
    "type": "control"
  }
],

```

```

    "size": 691,
    "status_fail": false,
    "tx_id": "383f8636842301b2fe292c5b8b2f540c6ed7867ba5751680b2e77827c300e41e"
  }
]

```

## Build Transaction Endpoint

Build transaction.

### Parameters

Object:

- **String** - **base\_transaction**, base data for the transaction, default is null.
- **Integer** - **ttl**, integer of the time to live in milliseconds, it means utxo will be reserved(locked) for build transaction in this time range, if the transaction will not to be submitted into block, it will be auto unlocked for build transaction again after this ttl time. it will be set to 5 minutes(300 seconds) defaultly when ttl is 0.
- **Integer** - **time\_range**, the block height at which this transaction will be allowed to be included in a block. If the block height of the main chain exceeds this value, the transaction will expire and no longer be valid.
- **Array of Object** - **actions**:
  - **Object**:
    - **String** - **account\_id** | **account\_alias**, (type is spend\_account) alias or ID of account.
    - **String** - **asset\_id** | **asset\_alias**, (type is spend\_account, issue, retire, control\_program and control\_address) alias or ID of asset.
    - **Integer** - **amount**, (type is spend\_account, issue, retire, control\_program and control\_address) the specified asset of the amount sent with this transaction.
    - **String** - **type**, type of transaction, valid types: 'spend\_account', 'issue', 'spend\_account\_unspent\_output', 'control\_address', 'control\_program', 'retire'.
    - **String** - **address**, (type is control\_address) address of receiver, the style of address is P2PKH or P2SH.
    - **String** - **control\_program**, (type is control\_program) control program of receiver.
    - **String** - **use\_unconfirmed**, (type is spend\_account and spend\_account\_unspent\_output) flag of use unconfirmed UTXO, default is false.
    - **String** - **arbitrary**, (type is retire) arbitrary additional data by hexadecimal.
    - **Array of Object** - **arguments**, (type is issue and spend\_account\_unspent\_output) arguments of contract, null when it's not contract.
      - **String** - **type**, type of argument, valid types: 'raw\_tx\_signature', 'data'.
      - **Object** - **raw\_data**, json object of argument content.

- **String- xpub**, (type is raw\_tx\_signature) root xpub.
- **String- derivation\_path**, (type is raw\_tx\_signature) derived path.
- **String- value**, (type is data) string of binary value.

## Returns

- Object of build-transaction - **transaction**, built transaction.

## Example

Build transaction of type **spend**.

### Request

```
curl -X POST http://localhost:9888/build-transaction -d
'{"base_transaction":null,"actions":[{"account_id":"0BF63M2U00A04","amount":20000000,"asset_id":"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff","type":"spend_account"},{"account_id":"0BF63M2U00A04","amount":99,"asset_id":"3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680","type":"spend_account"},{"amount":99,"asset_id":"3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680","address":"bm1q50u3z8empm5ke0g3ngl2t3sqtr6sd7cepd3z68","type":"control_address"}],"ttl":0,"time_range": 43432}'
```

Build transaction of type **issue**.

### Request

```
curl -X POST http://localhost:9888/build-transaction -d
'{"base_transaction":null,"actions":[{"account_id":"0BF63M2U00A04","amount":20000000,"asset_id":"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff","type":"spend_account"},{"amount":10000,"asset_id":"3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680","type":"issue"},{"amount":10000,"asset_id":"3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680","address":"ey1q50u3z8empm5ke0g3ngl2t3sqtr6sd7cepd3z68","type":"control_address"}],"ttl":0,"time_range": 43432}'
```

Build transaction of type **address**.

### Request

```
curl -X POST http://localhost:9888/build-transaction -d
'{"base_transaction":null,"actions":[{"account_id":"0BF63M2U00A04","amount":20000000,"asset_id":"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff","type":"spend_account"},{"account_id":"0BF63M2U00A04","amount":99,"asset_id":"3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680","type":"spend_account"},{"amount":99,"asset_id":"3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680","address":"ey1q50u3z8empm5ke0g3ngl2t3sqtr6sd7cepd3z68","type":"control_address"}],"ttl":0,"time_range": 43432}'
```

```
e_range": 43432}'
```

Build transaction of type **retire**.

### Request

```
curl -X POST http://localhost:9888/build-transaction -d
'{"base_transaction":null,"actions":[{"account_id":"0BF63M2U00A04","amount":20000000,"
asset_id":"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff","type":"s
pend_account"}, {"account_id":"0BF63M2U00A04","amount":99,"asset_id":"3152a15da72be51b3
30e1c0f8e1c0db669269809da4f16443ff266e07cc43680","type":"spend_account"}, {"amount":99,
"asset_id":"3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680","arbitra
ry":"77656c636f6d65efbc8ce6aca2e8bf8ee69da5e588b0e58e9fe5ad90e4b896e7958c","type":"ret
ire"}], "ttl":0, "time_range":43432}'
```

Build transaction of type **spend\_account\_unspent\_output**(user can get **UTXO** information by calling the **list-unspent-outputs** endpoint).



- action field **output\_id** correspond to **UTXO** result **id** field
- UTXO asset and amount will be spent in this transaction
- transaction fee is (utxo **asset\_amount** - output **asset\_amount**)

### Request

```
curl -X POST http://localhost:9888/build-transaction -d
'{"base_transaction":null,"actions":[{"type":"spend_account_unspent_output","output_id
":"01c6cccc6f522228cd4518bba87e9c43fbf55fdf7eb17f5aa300a037db7dca0cb"}, {"amount":412430
00000,"asset_id":"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff","a
ddress":"sy1qmw8c5s29zlexknfahrze3ghv1qrtn2huuntvnpn","type":"control_address"}], "ttl":
0, "time_range":0}'
```

**Response (this type is **spend**, the other types are similar)**

```
{
  "allow_additional_actions": false,
  "local": true,
  "raw_transaction":
  "0701000020161015fb6a63a3361170afca03c9d5ce1f09fe510187d69545e09f95548b939cd7fffa3fff
  ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff80fc93afdf01000116001426b
  d1b851cf6eb8a701c20c184352ad8720eeee90100015d015bb6a63a3361170afca03c9d5ce1f09fe510187
  d69545e09f95548b939cd7fffa33152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc
  43680c03e0101160014489a678741ccc844f9e5c502f7fac0a665bedb25010003013effffffffffffffff
  ffffffffffffffffffffffffffffffffffffffffffffffffffffffffff80a2cfa5df0101160014948fb4f500e66d20fba
  cb903fe108ee81f9b6d9500013a3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc
  43680dd3d01160014cd5a822b34e3084413506076040d508bb12232c70001393152a15da72be51b330e1c0
  f8e1c0db669269809da4f16443ff266e07cc436806301160014a3f911f3b0ee96cbd119a3ea5c60058f50
```



```

6fb1900",
"signing_instructions": [
  {
    "position": 0,
    "witness_components": [
      {
        "keys": [
          {
            "derivation_path": [
              "010100000000000000",
              "0500000000000000"
            ],
            "xpub":
"ee9dd8affdef7e0cacd0fbbf310217c7f588156c28e414db74c27afaedd8f876cf54547a672b431ff06ee
8a146207df9595638a041b55ada1a764a8b5b30bda0"
          }
        ],
        "quorum": 1,
        "signatures": null,
        "type": "raw_tx_signature"
      },
      {
        "type": "data",
        "value": "62a73b6b7ffe52b6ad782b0e0efdc8309bf2f057d88f9a17d125e41bb11dbb88"
      }
    ]
  },
  {
    "position": 1,
    "witness_components": [
      {
        "keys": [
          {
            "derivation_path": [
              "010100000000000000",
              "0600000000000000"
            ],
            "xpub":
"ee9dd8affdef7e0cacd0fbbf310217c7f588156c28e414db74c27afaedd8f876cf54547a672b431ff06ee
8a146207df9595638a041b55ada1a764a8b5b30bda0"
          }
        ],
        "quorum": 1,
        "signatures": null,
        "type": "raw_tx_signature"
      },
      {
        "type": "data",
        "value": "ba5a63e7416caeb945eefc2ce874f40bc4aaf6005a1fc792557e41046f7e502f"
      }
    ]
  }
]

```

```
}  
]  
}
```

## Build Chain Transactions Endpoint

Build chain transactions. To solve the problem of excessive **utxo** causing the transaction to fail, the **utxo** merge will be performed automatically. Currently, only **EY** transactions are supported.



This feature requires the **core** software to be higher than **v1.0.1**.

### Parameters

Object:

- **String** - **base\_transaction**, base data for the transaction, default is null.
- **Integer** - **ttl**, integer of the time to live in milliseconds, it means utxo will be reserved(locked) for build transaction in this time range, if the transaction will not to be submitted into block, it will be auto unlocked for build transaction again after this ttl time. it will be set to 5 minutes(300 seconds) defaultly when ttl is 0.
- **Integer** - **time\_range**, time stamp(block height)is maximum survival time for the transaction, the transaction will be not submit into block after this time stamp.
- **Array of Object** - **actions**:
  - **Object**:
    - **String** - **account\_id** | **account\_alias**, (type is spend\_account) alias or ID of account.
    - **String** - **asset\_id** | **asset\_alias**, (type is spend\_account, issue, retire, control\_program and control\_address) alias or ID of asset.
    - **Integer** - **amount**, (type is spend\_account, issue, retire, control\_program and control\_address) the specified asset of the amount sent with this transaction.
    - **String**- **type**, type of transaction, valid types: 'spend\_account', 'issue', 'spend\_account\_unspent\_output', 'control\_address', 'control\_program', 'retire'.
    - **String** - **address**, (type is control\_address) address of receiver, the style of address is P2PKH or P2SH.
    - **String** - **control\_program**, (type is control\_program) control program of receiver.
    - **String** - **use\_unconfirmed**, (type is spend\_account and spend\_account\_unspent\_output) flag of use unconfirmed UTXO, default is false.
    - **Array of Object** - **arguments**, (type is issue and spend\_account\_unspent\_output) arguments of contract, null when it's not contract.
      - **String**- **type**, type of argument, valid types: 'raw\_tx\_signature', 'data'.
      - **Object**- **raw\_data**, json object of argument content.
        - **String**- **xpub**, (type is raw\_tx\_signature) root xpub.

- **String- derivation\_path**, (type is raw\_tx\_signature) derived path.
- **String- value**, (type is data) string of binary value.

## Returns

- Object of raw\_transaction - **raw\_transaction**, builded transactions.
- Object of signing\_instructions - **signing\_instructions**, Information used to sign a transactions.

## Example

Build chain transaction of type **spend**.

### Request

```
curl -X POST http://localhost:9888//build-chain-transactions -d '{"base_transaction":
null,"actions":[{"account_id":"0JCH28A600A02","amount":30000500000000,"asset_id":"ffff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff","type":
"spend_account"}, {"amount": 300004900000000,"asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff","address":
"sm1qx93sge8jkgzcl7p7led7uqr596hjm2xe558lkr","type": "control_address"}],"ttl":
1000000,"time_range": 0}'
```

### Response

```
{
  "status": "success",
  "data": [{
    "raw_transaction":
    "0701000201620160a0d36052ca3d1335120ae48e1ffb2fb6b25588628eff90fa88bef3117dfb4301fffff
    fffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff80ddb2c490e9060101160014316
    30464f2b2058fe3c1fe5bee00742eaf2da8d901000161015f72de2064ab999acf22c05b5cf9c7d53164f80
    038b46b1ce426708514a30a3485fffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
    fffff80d4f4f69901000116001431630464f2b2058fe3c1fe5bee00742eaf2da8d9010001013fffffffff
    fffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff8084c5b6aaea060116001431630464f
    2b2058fe3c1fe5bee00742eaf2da8d900",
    "signing_instructions": [{
      "position": 0,
      "witness_components": [{
        "type": "raw_tx_signature",
        "quorum": 1,
        "keys": [{
          "xpub":
          "b4d084e77bcd7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f3514b461
          f6931ac2073f586a35cd628c90270063725e6e1e983",
          "derivation_path": ["010100000000000000", "0100000000000000"]
        }],
      "signatures": null
    }], {
```

```

        "type": "data",
        "value":
"a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a8973919"
    ]
}, {
    "position": 1,
    "witness_components": [{
        "type": "raw_tx_signature",
        "quorum": 1,
        "keys": [{
            "xpub":
"a4d084e77bcd7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f3514b461
f6931ac2073f586a35cd628c90270063725e6e1e983",
            "derivation_path": ["010100000000000000", "0100000000000000"]
        }],
        "signatures": null
    }], {
        "type": "data",
        "value":
"a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a8973919"
    ]
}],
    "allow_additional_actions": false
}, {
    "raw_transaction":
"0701000101620160571cc5d99a2994ff6b192bc9387838a3651245cb66dad4a6bc5f660310cebfa9ffffff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff8084c5b6aaea060001160014316
30464f2b2058fe3c1fe5bee00742eaf2da8d9010002013effffffffffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffff80faafed99010116001431630464f2b2058fe3c1fe5bee00742eaf2da8d90
0013ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff80ddb2c490e906011
6001431630464f2b2058fe3c1fe5bee00742eaf2da8d900",
    "signing_instructions": [{
        "position": 0,
        "witness_components": [{
            "type": "raw_tx_signature",
            "quorum": 1,
            "keys": [{
                "xpub":
"a4d084e77bcd7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f3514b461
f6931ac2073f586a35cd628c90270063725e6e1e983",
                "derivation_path": ["010100000000000000", "0100000000000000"]
            }],
            "signatures": null
        }], {
            "type": "data",
            "value":
"a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a8973919"
        }
    ]
}],
    "allow_additional_actions": false
}]

```

```
}
```

## Sign Transaction Endpoint

Sign a transaction.

### Parameters

Object:

- **String** - **password**, signature of the password.
- **Object** - **transaction**, build transaction.

### Returns

Object:

- **Boolean** - **sign\_complete**, returns true if sign successfully and false otherwise.
- **Object of sign-transaction** - **transaction**, signed transaction.

### Example

Perform the signature of a transaction.

### Request

```
curl -X POST http://localhost:9888/sign-transaction -d
'{"password":"123456","transaction":{"allow_additional_actions":false,"local":true,"raw_transaction":"07010000020161015fb6a63a3361170afca03c9d5ce1f09fe510187d69545e09f95548b939cd7fffa3ffffffffffffffffffffffffffffffffffffffffffffffff80fc93afdf01000116001426bd1b851cf6eb8a701c20c184352ad8720eeee90100015d015bb6a63a3361170afca03c9d5ce1f09fe510187d69545e09f95548b939cd7fffa33152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680c03e0101160014489a678741ccc844f9e5c502f7fac0a665bedb25010003013effffffffffffffffffffffffffffffffffffffffffffffffff80a2cfa5df0101160014948fb4f500e66d20fbacb903fe108ee81f9b6d9500013a3152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680dd3d01160014cd5a822b34e3084413506076040d508bb12232c70001393152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc436806301160014a3f911f3b0ee96cbd119a3ea5c60058f506fb1900","signing_instructions":[{"position":0,"witness_components":[{"keys":[{"derivation_path":["010100000000000000","0500000000000000"],"xpub":"ee9dd8affdef7e0cacd0fbbf310217c7f588156c28e414db74c27afaedd8f876cf54547a672b431ff06ee8a146207df9595638a041b55ada1a764a8b5b30bda0"}],"quorum":1,"signatures":null,"type":"raw_tx_signature"},{"type":"data","value":"62a73b6b7ffe52b6ad782b0e0efdc8309bf2f057d88f9a17d125e41bb11dbb88"}]},{"position":1,"witness_components":[{"keys":[{"derivation_path":["010100000000000000","0600000000000000"],"xpub":"ee9dd8affdef7e0cacd0fbbf310217c7f588156c28e414db74c27afaedd8f876cf54547a672b431ff06ee8a146207df9595638a041b55ada1a764a8b5b30bda0"}],"quorum":1,"signatures":null,"type":"raw_tx_signature"},{"type":"data","value":"ba5a63e7416cae945eefc2ce874f40bc4aaf6005a1fc792557e41046f7e502f"}]}}]}'
```

## Response

```
{
  "sign_complete": true,
  "transaction": {
    "allow_additional_actions": false,
    "local": true,
    "raw_transaction":
      "0701000020161015fb6a63a3361170afca03c9d5ce1f09fe510187d69545e09f95548b939cd7fffa3fff
      ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff80fc93afd01000116001426b
      d1b851cf6eb8a701c20c184352ad8720eeee96302400d432e6f0e22da3168d76552273e60d23d432d61b4d
      ac53e6769d39a1097f1cd1bd8e54c7d39eda334803e5c904bc2de2f27ff29748166e0334dcfded20e980b2
      062a73b6b7ffe52b6ad782b0e0efdc8309bf2f057d88f9a17d125e41bb11dbb88015d015bb6a63a3361170
      afca03c9d5ce1f09fe510187d69545e09f95548b939cd7fffa33152a15da72be51b330e1c0f8e1c0db6692
      69809da4f16443ff266e07cc43680c03e0101160014489a678741ccc844f9e5c502f7fac0a665bedb25630
      2401eadd84ad07c3643f71a35cc5669a2c1def96ae98e790d287217e6a3543fe602dd90afffe853c729bd5
      237a28f33538df631572847d9870829fb1fd1100ff20820ba5a63e7416caeb945eefc2ce874f40bc4aaf60
      05a1fc792557e41046f7e502f03013efffffffffffffffffffffffffffffffffffffffffffffffffffffff
      ffffffffff80a2cfa5df0101160014948fb4f500e66d20fbacb903fe108ee81f9b6d9500013a3152a15da72
      be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43680dd3d01160014cd5a822b34e3084413506
      076040d508bb12232c70001393152a15da72be51b330e1c0f8e1c0db669269809da4f16443ff266e07cc43
      6806301160014a3f9111f3b0ee96cbd119a3ea5c60058f506fb1900",
    "signing_instructions": [
      {
        "position": 0,
        "witness_components": [
          {
            "keys": [
              {
                "derivation_path": [
                  "010100000000000000",
                  "0500000000000000"
                ],
                "xpub":
                  "ee9dd8affdef7e0cacd0fbbf310217c7f588156c28e414db74c27afaedd8f876cf54547a672b431ff06ee
                  8a146207df9595638a041b55ada1a764a8b5b30bda0"
              }
            ],
            "quorum": 1,
            "signatures": [
              "0d432e6f0e22da3168d76552273e60d23d432d61b4dac53e6769d39a1097f1cd1bd8e54c7d39eda334803
              e5c904bc2de2f27ff29748166e0334dcfded20e980b",
              {
                "type": "raw_tx_signature"
              },
              {
                "type": "data",
                "value":
                  "62a73b6b7ffe52b6ad782b0e0efdc8309bf2f057d88f9a17d125e41bb11dbb88"
              }
            ]
          }
        ]
      }
    ]
  }
}
```

```

    ]
  },
  {
    "position": 1,
    "witness_components": [
      {
        "keys": [
          {
            "derivation_path": [
              "010100000000000000",
              "060000000000000000"
            ],
            "xpub":
"ee9dd8affdef7e0cacd0fbbf310217c7f588156c28e414db74c27afaedd8f876cf54547a672b431ff06ee8a146207df9595638a041b55ada1a764a8b5b30bda0"
          }
        ],
        "quorum": 1,
        "signatures": [
          "1eadd84ad07c3643f71a35cc5669a2c1def96ae98e790d287217e6a3543fe602dd90afffe853c729bd5237a28f33538df631572847d9870829fb1fd1100ff208"
        ],
        "type": "raw_tx_signature"
      },
      {
        "type": "data",
        "value":
"ba5a63e7416cae945eefc2ce874f40bc4aaf6005a1fc792557e41046f7e502f"
      }
    ]
  }
]
}
}

```

## Sign Transactions Endpoint

Sign transactions used for batch signing transactions.

### Parameters

Object:

- **String** - **password**, signature of the password.
- **Object** - **transaction**, build transactions.

## Returns

Object:

- **Boolean** - **sign\_complete**, returns true if sign successfully and false otherwise.
- **Object of sign-transactions** - **transaction**, signed transactions.

## Example

Perform the signature of a batch of transactions.

### Request

```
curl -X POST http://localhost:9888/sign-transactions -d
'{"password":"123456","transactions":[{"raw_transaction":"0701000201620160a0d36052ca3d
1335120ae48e1ffb2fb6b25588628eff90fa88bef3117dfb4301ffffffffffffffffffffffffffff
ffffffffffffffffffffffffffffffff80ddb2c490e906010116001431630464f2b2058fe3c1fe5bee00742e
af2da8d901000161015f72de2064ab999acf22c05b5cf9c7d53164f80038b46b1ce426708514a30a3485ff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffff80d4f4f69901000116001431
630464f2b2058fe3c1fe5bee00742eaf2da8d9010001013fffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffff8084c5b6aaea060116001431630464f2b2058fe3c1fe5bee00742eaf2da8
d900","signing_instructions":[{"position":0,"witness_components":[{"type":"raw_tx_sign
ature","quorum":1,"keys":[{"xpub":"b4d084e77bcda7fd8a37e31135200b2a6af98d19018674125dc
6290dd14176f92523f229d9f1f3514b461f6931ac2073f586a35cd628c90270063725e6e1e983","deriva
tion_path":["010100000000000000","0100000000000000"]}], "signatures":null}, {"type":"dat
a","value":"a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a8973919"}]}, {"pos
ition":1,"witness_components":[{"type":"raw_tx_signature","quorum":1,"keys":[{"xpub":"
b4d084e77bcda7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f3514b461f
6931ac2073f586a35cd628c90270063725e6e1e983","derivation_path":["010100000000000000","0
10000000000000000"]}], "signatures":null}, {"type":"data","value":"a86ab33efa9d71994270898
ad99f198d60889ef617d5eaf25e776929a8973919"}]}], "allow_additional_actions":false}, {"raw
_transaction":"0701000101620160571cc5d99a2994ff6b192bc9387838a3651245cb66dad4a6bc5f660
310cebfa9ffffffffffffffffffffffffffffffffffffffffffffffffffffffff8084c5b6aaea0
6000116001431630464f2b2058fe3c1fe5bee00742eaf2da8d9010002013efffffffffffffffffffffff
ffffffffffffffffffffffffffffffff80faafed99010116001431630464f2b2058fe3c1fe5bee0
0742eaf2da8d900013ffffffffffffffffffffffffffffffffffffffffffffffffffffffff80d
db2c490e9060116001431630464f2b2058fe3c1fe5bee00742eaf2da8d900","signing_instructions":
[{"position":0,"witness_components":[{"type":"raw_tx_signature","quorum":1,"keys":[{"x
pub":"b4d084e77bcda7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f351
4b461f6931ac2073f586a35cd628c90270063725e6e1e983","derivation_path":["0101000000000000
00","0100000000000000"]}], "signatures":null}, {"type":"data","value":"a86ab33efa9d71994
270898ad99f198d60889ef617d5eaf25e776929a8973919"}]}], "allow_additional_actions":false}
}]'
```

### Response

```
{
  "status": "success",
  "data": {
```



```

"transaction": [{
  "raw_transaction":
"0701000201620160a0d36052ca3d1335120ae48e1ffb2fb6b25588628eff90fa88bef3117dfb4301ffffff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff80ddb2c490e9060101160014316
30464f2b2058fe3c1fe5bee00742eaf2da8d9630240acb57bc06f7e5de99ef3e630ce34fc74c33d4694301
202968092ca50ae7842e3331bfeb0cf7b65f383e27670c4d58ae0eb0b77e5355957ca729298d2b4e2470c2
0a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a89739190161015f72de2064ab999
acf22c05b5cf9c7d53164f80038b46b1ce426708514a30a3485fffffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffff80d4f4f69901000116001431630464f2b2058fe3c1fe5bee00742eaf2
da8d96302404298424e89e5528f1d0cdd9028489b9d9e3f031ec34a74440cacc7900dc1eac9359c408a434
2fc6cef935d2978919df8b23f3912ac4419800d375fac06ddb50620a86ab33efa9d71994270898ad99f198
d60889ef617d5eaf25e776929a897391901013fffffffffffffffffffffffffffffffffffffffffffffffffffff
ffffffffffffffff8084c5b6a000116001431630464f2b2058fe3c1fe5bee00742eaf2da8d900",
  "signing_instructions": [{
    "position": 0,
    "witness_components": [{
      "type": "raw_tx_signature",
      "quorum": 1,
      "keys": [{
        "xpub":
"b4d084e77bcd7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f3514b461
f6931ac2073f586a35cd628c90270063725e6e1e983",
        "derivation_path": [
          "010100000000000000",
          "0100000000000000"
        ]
      }],
      "signatures": [
"acb57bc06f7e5de99ef3e630ce34fc74c33d4694301202968092ca50ae7842e3331bfeb0cf7b65f383e27
670c4d58ae0eb0b77e5355957ca729298d2b4e2470c"
      ]
    },
    {
      "type": "data",
      "value":
"a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a8973919"
    }
  ]
},
{
  "position": 1,
  "witness_components": [{
    "type": "raw_tx_signature",
    "quorum": 1,
    "keys": [{
      "xpub":
"b4d084e77bcd7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f3514b461
f6931ac2073f586a35cd628c90270063725e6e1e983",
      "derivation_path": [
        "010100000000000000",

```

```

        "0100000000000000"
    ],
    },
    "signatures": [

"4298424e89e5528f1d0cdd9028489b9d9e3f031ec34a74440cacc7900dc1eac9359c408a4342fc6cef935
d2978919df8b23f3912ac4419800d375fac06ddb506"

    ],
    },
    {
        "type": "data",
        "value":
"a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a8973919"
    }
    ],
    },
    "allow_additional_actions": false
},
{
    "raw_transaction":
"0701000101620160571cc5d99a2994ff6b192bc9387838a3651245cb66dad4a6bc5f660310cebfa9ffffff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff8084c5b6aaea060001160014316
30464f2b2058fe3c1fe5bee00742eaf2da8d96302408c742d77eba6c56a8db8c114e60be6c6263df6120ae
fd7538376129d04ec71b78b718c2085bba85254b44bf4600ba31d4c5a7869d0be0c46d88bd5eb27490e082
0a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a897391902013effffffffffffff
ffffffffffffffffffffffffffffffffffffffff80faafed99010116001431630464f2b2058fe
3c1fe5bee00742eaf2da8d900013fffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
ffffff80ddb2c490e9060116001431630464f2b2058fe3c1fe5bee00742eaf2da8d900",
    "signing_instructions": [{
        "position": 0,
        "witness_components": [{
            "type": "raw_tx_signature",
            "quorum": 1,
            "keys": [{
                "xpub":
"b4d084e77bcda7fd8a37e31135200b2a6af98d19018674125dc6290dd14176f92523f229d9f1f3514b461
f6931ac2073f586a35cd628c90270063725e6e1e983",
                "derivation_path": [
                    "010100000000000000",
                    "0100000000000000"
                ]
            }
        ]
    }],
    "signatures": [

"8c742d77eba6c56a8db8c114e60be6c6263df6120aefd7538376129d04ec71b78b718c2085bba85254b44
bf4600ba31d4c5a7869d0be0c46d88bd5eb27490e08"

    ],
    },
    {
        "type": "data",

```

```

        "value":
          "a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a8973919"
        }
      ]
    },
    "allow_additional_actions": false
  }
],
"sign_complete": true
}
}

```

## Network Endpoints

These endpoints are available regardless of the wallet being disabled or not.

### Submit Transaction Endpoint

Submit transaction.

#### Parameters

Object:

- **Object** - **raw\_transaction**, **raw\_transaction** of signed transaction.

#### Returns

Object:

- **String** - **tx\_id**, transaction id, hash of transaction.

#### Example

Submit a raw transaction.

#### Request

```

curl -X POST http://localhost:9888/submit-transaction -d
'{"raw_transaction": "07010000010161015ffe8bdb49bbd08f711a54f0fbed4141b74c276de44c83199
9aac43bdd56f98309ffffffffffffffffffffffffffffffffffffffffffffffffffffffff80c0b
1ca94120001160014d61f9b3354771283461e6cb269bec98e7ee975f6630240403d7b35ec72a80816b2182
2d645adc98af2c1f07d5b379dda4527d8585ec12ef213ada312e3807ae0ccf7206575f313ffe2b405a2863
09d3172feabe07e7e0620d013706a314a57e84c2b262c2a291e8e2b063785aea9338476a66d41be4de4f20
2013effffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff80bc82eb931201160
014bdf260424fd2f322dbec9ce4ddbbaed8618d8e959000139fffffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffff6301160014a3f9111f3b0ee96cbd119a3ea5c60058f506fb1900"}'

```

## Response

```
{
  "tx_id": "2c0624a7d251c29d4d1ad14297c69919214e78d995affd57e73fbf84ece316cb"
}
```

## Submit Transactions Endpoint

Submit transactions used for batch submit transactions.

### Parameters

Object:

- **Object** - **raw\_transactions**, **raw\_transactions** of signed transactions.

### Returns

Object:

- **String** - **tx\_id**, transactions id, hash of transactions.

### Example

Submit a collection of raw transactions.

### Request

```
curl -X POST http://localhost:9888/submit-transactions -d
'{"raw_transactions":["0701000201620160a0d36052ca3d1335120ae48e1ffb2fb6b25588628eff90f
a88bef3117dfb4301ffffffffffffffffffffffffffffffffffffffffffffffffffffffff80ddb
2c490e906010116001431630464f2b2058fe3c1fe5bee00742eaf2da8d9630240acb57bc06f7e5de99ef3e
630ce34fc74c33d4694301202968092ca50ae7842e3331bfeb0cf7b65f383e27670c4d58aeeeb0b77e5355
957ca729298d2b4e2470c20a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a897391
90161015f72de2064ab999acf22c05b5cf9c7d53164f80038b46b1ce426708514a30a3485fffffffffff
ffffffffffffffffffffffffffffffffffffffffffffffff80d4f4f69901000116001431630464f2b20
58fe3c1fe5bee00742eaf2da8d96302404298424e89e5528f1d0cdd9028489b9d9e3f031ec34a74440cacc
7900dc1eac9359c408a4342fc6cef935d2978919df8b23f3912ac4419800d375fac06ddb50620a86ab33ef
a9d71994270898ad99f198d60889ef617d5eaf25e776929a897391901013fffffffffffffffffffff
ffffffffffffffffffffffffffffffffffffffff8084c5b6aaea060116001431630464f2b2058fe3c1fe5be
e00742eaf2da8d900","0701000101620160571cc5d99a2994ff6b192bc9387838a3651245cb66dad4a6bc
5f660310cebfa9ffffffffffffffffffffffffffffffffffffffffffffffffffffffff8084c5b6
aaea06000116001431630464f2b2058fe3c1fe5bee00742eaf2da8d96302408c742d77eba6c56a8db8c114
e60be6c6263df6120aefd7538376129d04ec71b78b718c2085bba85254b44bf4600ba31d4c5a7869d0be0c
46d88bd5eb27490e0820a86ab33efa9d71994270898ad99f198d60889ef617d5eaf25e776929a897391902
013effffffffffffffffffffffffffffffffffffffffffffffffffffffff80faafed9901011600
1431630464f2b2058fe3c1fe5bee00742eaf2da8d900013ffffffffffffffffffffffffffffffffffff
ffffffffffffffffffffffff80ddb2c490e9060116001431630464f2b2058fe3c1fe5bee00742eaf2da8
```

```
d900"]}]'
```

## Response

```
{
  "status": "success",
  "data": {
    "tx_id": ["8524bf38701c17c57e2ad7368c0d6c815eb30e92713ff5dd86c1a931cddf2e95",
"a0bbfb75c9a00bb2d4801aa95ed0479993a67acfd1cec5b77a8ff86966f52dac"]
  }
}
```

# Estimate Transaction Gas Endpoint

Estimate consumed neu( $1EY = 10^8 NEU$ ) for the transaction.

## Parameters

Object:

- **Object** - **transaction\_template**, builded transaction response.

## Returns

Object:

- **Integer** - **total\_neu**, total consumed neu( $1EY = 10^8 NEU$ ) for execute transaction, **total\_neu** is rounded up **storage\_neu** + **vm\_neu**.
- **Integer** - **storage\_neu**, consumed neu for storage transaction .
- **Integer** - **vm\_neu**, consumed neu for execute VM.

## Example

Query about a transaction's gas.

## Request

```
curl -X POST http://localhost:9888/estimate-transaction-gas -d
'{"transaction_template":{"allow_additional_actions":false,"raw_transaction":"07010001
0161015ffe8a1209937a6a8b22e8c01f056fd5f1730734ba8964d6b79de4a639032cecddffffffffffffff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff8099c4d59901000116001485eb6eee802333
2da85df60157dc9b16cc553fb2010002013dffffffffffffffffffffffffffffffffffffffffffffffffffffff
ffffffff80afa08b4f011600142b4fd033bc76b4ddf5cb00f625362c4bc7b10efa00013dfffffffff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff8090dfc04a011600146eea1ce6cfa5
b718ae8094376be9bc1a87c9c82700","signing_instructions":[{"position":0,"witness_compone
nts":[{"keys":[{"derivation_path":["010100000000000000","0100000000000000"],"xpub":"cb
4e5932d808ee060df9552963d87f60edac42360b11d4ad89558ef2acea4d4aaf4818f2ebf5a599382b8dfc
```

```
e0a0c798c7e44ec2667b3a1d34c61ba57609de55"}], "quorum": 1, "signatures": null, "type": "raw_tx_signature"}, {"type": "data", "value": "1c9b5c1db7f4afe31fd1b7e0495a8bb042a271d8d7924d4fc1ff7cf1bff15813"}]]}]}'
```

## Response

```
{
  "storage_neu": 3840000,
  "total_neu": 5259000,
  "vm_neu": 1419000
}
```

# Create Access Token Endpoint

Create a named access token that provides basic authentication for the HTTP protocol. This endpoint returns a token containing a username and password, separated by a colon.

## Parameters

Object:

- **String** - **id**, token ID.

Optional:

- **String** - **type**, type of token.

## Returns

Object:

- **String** - **token**, access token, authentication username and password are separated by a colon.
- **String** - **id**, token ID.
- **String** - **type**, type of token.
- **Object** - **created\_at**, time to create token.

## Example

Create an named access token.

## Request

```
curl -X POST http://localhost:9888/create-access-token -d '{"id":"token1"}'
```

## Response

```
{
  "token": "token1:1fee70f537128a201338bd5f25a3adbf33dad02eae4f4c9ac43f336a069df8f3",
  "id": "token1",
  "created_at": "2024-03-20T18:56:01.043919771+08:00"
}
```

## List Access Tokens Endpoint

Returns the list of all available access tokens.

### Parameters

None.

### Returns

- **Array of Object**, access token array.
  - **Object**:
    - **String** - **token**, access token.
    - **String** - **id**, token ID.
    - **String** - **type**, type of token.
    - **Object** - **created\_at**, time to create token.

### Example

List all the available access tokens.

### Request

```
curl -X POST http://localhost:9888/list-access-tokens -d '{}'
```

### Response

```
[
  {
    "token":
"token1:1fee70f537128a201338bd5f25a3adbf33dad02eae4f4c9ac43f336a069df8f3",
    "id": "token1",
    "created_at": "2024-03-20T18:56:01.043919771+08:00"
  },
  {
    "token": "alice:78598c6d9fb9e3258d01f78005d4e5725ad0d45e20af90a30b577b407d4a2edd",

```

```
{
  "id": "alice",
  "created_at": "2024-03-20T18:56:01.043919771+08:00"
}
```

## Delete Access Token Endpoint

Delete existing access token.

### Parameters

Object:

- **String** - **id**, token ID.

### Returns

Nothing if the access token is deleted successfully.

### Example

Delete an existing access token.

### Request

```
curl -X POST http://localhost:9888/delete-access-token -d '{"id": "token1"}'
```

### Response

Nothing if the operation was successful.

## Check Access Token Endpoint

Check if an access token is valid.

### Parameters

Object:

- **String** - **id**, token ID.
- **String** - **secret**, secret of token, the second part of the colon division for token.

### Returns

None if the access token's validity checks out.



## Example

Check whether the access token is valid or not.

### Request

```
curl -X POST http://localhost:9888/check-access-token -d '{"id": "token1", "secret": "1fee70f537128a201338bd5f25a3adb33dad02eae4f4c9ac43f336a069df8f3"}'
```

### Response

Nothing if the operation was successful.

## Create Transaction Feed Endpoint

Create a transaction feed.

### Parameters

Object:

- **String** - **alias**, name of the transaction feed.
- **String** - **filter**, filter of the transaction feed.

### Returns

None if the transaction feed is created successfully.

## Example

Create a transaction feed by alias.

### Request

```
curl -X POST http://localhost:9888/create-transaction-feed -d '{"alias": "test1", "filter": "asset_id='84778a666fe453cf73b2e8c783dbc9e04bc4fd7cbb4f50caeae99cf9967ebed' AND amount_lower_limit = 50 AND amount_upper_limit = 100"}'
```

### Response

Nothing if the operation was successful.

## Get Transaction Feed Endpoint

Query details of a transaction feed by alias.

## Parameters

Object:

- **String** - **alias**, alias of the transaction feed.

## Returns

Object:

- **String** - **id**, id of the transaction feed.
- **String** - **alias**, alias of the transaction feed.
- **String** - **filter**, filter of the transaction feed.
- **Object** - **param**, param of the transaction feed.
  - **String** - **assetid**, asset id.
  - **Integer** - **lowerlimit**, the lower limit of asset amount.
  - **Integer** - **upperlimit**, the upper limit of asset amount.
  - **String** - **transtype**, type of transaction.

## Example

List the available transaction feed by alias.

### Request

```
curl -X POST http://localhost:9888/get-transaction-feed -d '{"alias": "test1"}'
```

### Response

```
{
  "alias": "test1",
  "filter":
  "asset_id='84778a666fe453cf73b2e8c783dbc9e04bc4fd7cbb4f50caeae99cf9967ebed' AND
  amount_lower_limit = 50 AND amount_upper_limit = 100",
  "param": {}
}
```

## List Transaction Feeds Endpoint

Returns the list of all available transaction feeds.

### Parameters

None.

## Returns

- **Array of Object**, the transaction feeds.
  - **Object**:
    - **String** - **id**, id of the transaction feed.
    - **String** - **alias**, name of the transaction feed.
    - **String** - **filter**, filter of the transaction feed.
    - **Object** - **param**, param of the transaction feed.
      - **String** - **assetid**, asset id.
      - **Integer** - **lowerlimit**, the lower limit of asset amount.
      - **Integer** - **upperlimit**, the upper limit of asset amount.
      - **String** - **transtype**, type of transaction.

## Example

List all the available **txfeed**.

### Request

```
curl -X POST http://localhost:9888/list-transaction-feeds -d '{}'
```

### Response

```
[
  {
    "alias": "test1",
    "filter":
"asset_id='84778a666fe453cf73b2e8c783dbc9e04bc4fd7cbb4f50caeaee99cf9967ebed' AND
amount_lower_limit = 50 AND amount_upper_limit = 100",
    "param": {}
  },
  {
    "alias": "test2",
    "filter":
"asset_id='cee6a588cc3fc280749021ef42d5209952a1e6feceada4e69dd8a424ad22b199' AND
amount_lower_limit = 30 AND amount_upper_limit = 100",
    "param": {}
  }
]
```

## Delete Transaction Feed Endpoint

Delete a transaction feed by alias.

## Parameters

### Object:

- **String** - **alias**, alias of the transaction feed.

## Returns

Nothing if the transaction feed is deleted successfully.

## Example

Delete a transaction feed by it's alias.

### Request

```
curl -X POST http://localhost:9888/delete-transaction-feed -d '{"alias": "test1"}'
```

### Response

Nothing if the operation was successful.

## Update Transaction Feed Endpoint

Update transaction feed.

## Parameters

### Object:

- **String** - **alias**, name of the transaction feed.
- **String** - **filter**, filter of the transaction feed.

## Returns

Nothing if the transaction feed is updated success.

## Example

Deleted when the **txfeed** exists, and recreate it with alias and filter:

### Request

```
curl -X POST http://localhost:9888/update-transaction-feed -d '{"alias": "test1",  
"filter": "asset_id='84778a666fe453cf73b2e8c783dbc9e04bc4fd7cbb4f50caeae99cf9967ebed'  
AND amount_lower_limit = 60 AND amount_upper_limit = 80"}'
```

## Response

Nothing if the operation was successful.

# Get Unconfirmed Transaction Endpoint

Query **mempool** transaction by transaction ID.

## Parameters

Object:

- **String** - **tx\_id**, transaction id, hash of transaction.

## Returns

Object:

- **String** - **id**, transaction id, hash of the transaction.
- **Integer** - **version**, version of transaction.
- **Integer** - **size**, size of transaction.
- **Integer** - **time\_range**, the time range of transaction.
- **Boolean** - **status\_fail**, whether the state of the request has failed.
- **String** - **mux\_id**, the previous transaction mux id(wallet enable can be acquired, this place is empty).
- **Array of Object** - **inputs**, object of inputs for the transaction(input struct please refer to get-transaction API description).
- **Array of Object** - **outputs**, object of outputs for the transaction(output struct please refer to get-transaction API description).

## Example

Retrieve a transaction from the **mempool** by **tx\_id**.

## Request

```
curl -X POST http://localhost:9888/get-unconfirmed-transaction -d '{"tx_id": "382090f24fbfc2f737fa7372b9d161a43f00d1c597a7130a56589d1f469d04b5"}'
```

## Response

```
{
  "id": "382090f24fbfc2f737fa7372b9d161a43f00d1c597a7130a56589d1f469d04b5",
  "inputs": [
    {
```

```

    "address": "ey1qqrm7ruecx7yrg9smtwmnmgj3umg9vcukgy5sdj",
    "amount": 41250000000,
    "asset_definition": {},
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "001400f7e1f338378834161b5bb73da251e6d0566396",
    "input_id": "a0c2fa0719bfe1446681537dcf1f8d0f03add093e29d12481eb807e07778d7b3",
    "spent_output_id":
"161b44e547a6cc68d732eb64fa38031da98211a99319e088cfe632223f9ac6d8",
    "type": "spend",
    "witness_arguments": [

    "cf0e1b217ab92ade8e81fab10f9f307bb5cc1ad947b5629e3f7a760aba722f5044f2ab59ec92fa4264ff5
811de4361abb6eabd7e75ffd28a813a98ceff434c01",
        "6890a19b21c326059eef211cd8414282a79d3b9203f2592064221fd360e778a7"
    ]
  }
],
"mux_id": "842cd07eed050b547377b5b123f14a5ec0d76933d564f030cf4d5d5c15769645",
"outputs": [
  {
    "address": "ey1qehxd5cdnepckh5jc72ggn30havd78lsgcqml7k",
    "amount": 21230000000,
    "asset_definition": {},
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014cdccda61b3c8716bd258f29089c5f7eb1be3fe08",
    "id": "a8f21ad24689c290634db85278f56d152efe6fe08bc194e5dee5127ed6d3ebee",
    "position": 0,
    "type": "control"
  },
  {
    "address": "ey1q2me9gwccnm3ehpnrcr99gcnj730js2zfucms3r",
    "amount": 20000000000,
    "asset_definition": {},
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "001456f2543b189ee39b8663c0ca546272f45f282849",
    "id": "78219e422ea3257aeb32f6d952b5ce5560dab1d6440c9f3aebcdaad2a852d2a8",
    "position": 1,
    "type": "control"
  }
],
"size": 664,
"status_fail": false,
"time_range": 0,
"version": 1
}

```

## List Unconfirmed Transactions Endpoint

Returns the total number of `mempool` transactions and the list of transaction IDs.

## Parameters

None.

## Returns

Object:

- **Integer** - **total**, version of transaction.
- **Array of Object** - **tx\_ids**, list of transaction id.

## Example

Retrieve the total of **mempool** transactions and their respective IDs.

### Request

```
curl -X POST http://localhost:9888/list-unconfirmed-transactions -d '{}'
```

### Response

```
{
  "total": 2,
  "tx_ids": [
    "382090f24fbfc2f737fa7372b9d161a43f00d1c597a7130a56589d1f469d04b5",
    "fc2da5dfa094c2170144f149fa07a312983157aec0ec95063a1319eedcb2d23b"
  ]
}
```

## Decode Raw Transaction Endpoint

Decode a serialized transaction hex string into a JSON object describing the transaction.

## Parameters

Object:

- **String** - **raw\_transaction**, hexstring of raw transaction.

## Returns

Object:

- **String** - **tx\_id**, transaction ID.
- **Integer** - **version**, version of transaction.
- **String** - **size**, size of transaction.

- **String** - **time\_range**, time range of transaction.
- **String** - **fee**, fee for sending transaction.
- **Array of Object** - **inputs**, object of inputs for the transaction(input struct please refer to get-transaction API description).
- **Array of Object** - **outputs**, object of outputs for the transaction

## Example

Ask for a decoded transaction from the contents of a raw transaction.

### Request

```
curl -X POST http://localhost:9888/decode-raw-transaction -d '{"raw_transaction":
"070100010161015fc8215913a270d3d953ef431626b19a89adf38e2486bb235da732f0afed515299ffffff
ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff8099c4d59901000116001456ac1
70c7965eeac1cc34928c9f464e3f88c17d8630240b1e99a3590d7db80126b273088937a87ba1e8d2f91021
a2fd2c36579f7713926e8c7b46c047a43933b008ff16ecc2eb8ee888b4ca1fe3fdf082824e0b3899b02202
fb851c6ed665fcd9ebc259da1461a1e284ac3b27f5e86c84164aa518648222602013effffffffffffffffff
ffffffffffffffffffffffffffffffffffffffff80bbd0ec980101160014c3d320e1dc4fe787e9f
13c1464e3ea5aae96a58f00013cffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
fffff8084af5f01160014bb93cdb4eca74b068321eeb84ac5d33686281b6500"}'
```

### Response

```
{
  "fee": 20000000,
  "inputs": [
    {
      "address": "sy1q26kpwrrrevhh2c8xrfy5vnaryu0ugc97csrdy69",
      "amount": 41250000000,
      "asset_definition": {},
      "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
      "control_program": "001456ac170c7965eeac1cc34928c9f464e3f88c17d8",
      "input_id": "9963265eb601df48501cc240e1480780e9ed6e0c8f18fd7dd57954068c5dfd02",
      "spent_output_id":
"01bb3309666618a1507cb5be845b17dee5eb8028ee7e71b17d74b4dc97085bc8",
      "type": "spend",
      "witness_arguments": [
        "b1e99a3590d7db80126b273088937a87ba1e8d2f91021a2fd2c36579f7713926e8c7b46c047a43933b008
ff16ecc2eb8ee888b4ca1fe3fdf082824e0b3899b02",
        "2fb851c6ed665fcd9ebc259da1461a1e284ac3b27f5e86c84164aa5186482226"
      ]
    }
  ],
  "outputs": [
    {
```



```

    "address": "sy1qc0fjpcwuf1nc06038s2xfc12t2hfdfv0lxzg7s",
    "amount": 4103000000,
    "asset_definition": {},
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014c3d320e1dc4fe787e9f13c1464e3ea5aae96a58f",
    "id": "567b34857614d16292220beaca16ce34b939c75023a49cc43fa432fff51ca0dd",
    "position": 0,
    "type": "control"
  },
  {
    "address": "sy1qhwfumd8v5a9sdqepa6uy43wnx6rzsxm9essn4l",
    "amount": 200000000,
    "asset_definition": {},
    "asset_id": "ffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
    "control_program": "0014bb93cdb4eca74b068321eeb84ac5d33686281b65",
    "id": "a8069d412e48c2b2994d2816758078cff46b215421706b4bad41f72a32928d92",
    "position": 1,
    "type": "control"
  }
],
"size": 332,
"time_range": 0,
"tx_id": "4c97d7412b04d49acc33762fc748cd0780d8b44086c229c1a6d0f2adfaaac2db",
"version": 1
}

```

## Get Block Count Endpoint

Returns the current block height for the blockchain.

### Parameters

None.

### Returns

Object:

- **Integer** - **block\_count**, recent block height of the blockchain.

### Example

Retrieve the current block height.

### Request

```
curl -X POST http://localhost:9888/get-block-count
```

## Response

```
{
  "block_count": 519
}
```

## Get Block Hash Endpoint

Returns the current block hash for the block height of the blockchain.

### Parameters

None.

### Returns

Object:

- **String** - **block\_hash**, recent block hash of the blockchain.

### Example

Retrieves the block's hash for the current block height.

### Request

```
curl -X http://localhost:9888/POST get-block-hash
```

## Response

```
{
  "block_hash": "997bf5cecb4df097991a7a121a7fd3cb5a404fa856e3d6032c791ac07bc7c74c"
}
```

## Get Block Endpoint

Returns the details of a block by block height or block hash.

### Parameters

Object: **block\_height** | **block\_hash**

Optional:

- **String** - **block\_hash**, hash of block.

- **Integer** - **block\_height**, height of block.

## Returns

Object:

- **String** - **hash**, hash of block.
- **Integer** - **size**, size of block.
- **Integer** - **version**, version of block.
- **Integer** - **height**, height of block.
- **String** - **previous\_block\_hash**, previous block hash.
- **Integer** - **timestamp**, timestamp of block.
- **Integer** - **nonce**, nonce value.
- **Integer** - **bits**, bits of difficulty.
- **String** - **difficulty**, difficulty value(String type).
- **String** - **transaction\_merkle\_root**, merkle root of transaction.
- **String** - **transaction\_status\_hash**, merkle root of transaction status.
- **Array of Object** - **transactions**, transaction object:
  - **String** - **id**, transaction id, hash of the transaction.
  - **Integer** - **version**, version of transaction.
  - **Integer** - **size**, size of transaction.
  - **Integer** - **time\_range**, the unix timestamp for when the request was responded.
  - **Boolean** - **status\_fail**, whether the state of the request has failed.
  - **String** - **mux\_id**, the previous transaction mux id(source id of utxo).
  - **Array of Object** - **inputs**, object of inputs for the transaction.
    - **String** - **type**, the type of input action, available option include: 'spend', 'issue', 'coinbase'.
    - **String** - **asset\_id**, asset id.
    - **String** - **asset\_alias**, name of asset.
    - **Object** - **asset\_definition**, definition of asset(json object).
    - **Integer** - **amount**, amount of asset.
    - **Object** - **issuance\_program**, issuance program, it only exist when type is 'issue'.
    - **Object** - **control\_program**, control program of account, it only exist when type is 'spend'.
    - **String** - **address**, address of account, it only exist when type is 'spend'.
    - **String** - **spent\_output\_id**, the front of outputID to be spent in this input, it only exist when type is 'spend'.
    - **String** - **account\_id**, account id.
    - **String** - **account\_alias**, name of account.

- **Object** - **arbitrary**, arbitrary information can be set by miner, it only exists when type is 'coinbase'.
- **String** - **input\_id**, hash of input action.
- **Array of String** - **witness\_arguments**, witness arguments.
- **Array of Object** - **outputs**, object of outputs for the transaction.
  - **String** - **type**, the type of output action, available options include: 'retire', 'control'.
  - **String** - **id**, outputid related to utxo.
  - **Integer** - **position**, position of outputs.
  - **String** - **asset\_id**, asset id.
  - **String** - **asset\_alias**, name of asset.
  - **Object** - **asset\_definition**, definition of asset(json object).
  - **Integer** - **amount**, amount of asset.
  - **String** - **account\_id**, account id.
  - **String** - **account\_alias**, name of account.
  - **Object** - **control\_program**, control program of account.
  - **String** - **address**, address of account.

## Example

Get specified block information by **block\_hash** or **block\_height**, if both exist, the block result is queried by hash.

### Request

```
curl -X POST http://localhost:9888/get-block -d '{"block_height": 43, "block_hash": "886a8e85b275e7d65b569ba510875c0e63dece1a94569914d7624c0dac8002f9"}'
```

### Response

```
{
  "bits": 2305843009222082600,
  "difficulty": "5549086336",
  "hash": "886a8e85b275e7d65b569ba510875c0e63dece1a94569914d7624c0dac8002f9",
  "height": 43,
  "nonce": 3,
  "previous_block_hash":
"2c72ccbd53b92a4f9423c5b610b4e106bbe8fbf3ecf2e16a1266b17ee323ff9d",
  "size": 386,
  "timestamp": 1521614189,
  "transaction_merkle_root":
"77d40262cfeca3a16d4587132974552ef00951e43ce567a26801ebc3dbdb4d96",
  "transaction_status_hash":
```

```

"53c0ab896cb7a3778cc1d35a271264d991792b7c44f5c334116bb0786dbc5635",
"transactions": [
  {
    "id": "4576b1b1ec251da3263dbdd5486bcbf9a1cd1f712172dbe7a7a5fe46ab194629",
    "inputs": [
      {
        "amount": 0,
        "arbitrary": "09",
        "asset_definition": "7b7d",
        "asset_id":
"0000000000000000000000000000000000000000000000000000000000000000",
        "input_id":
"6cb8491e4b1cbdc052c2fdb5f2849194d59118b954d5ea5244bbd20e3cff3b80",
        "type": "coinbase",
        "witness_arguments": null
      }
    ],
    "mux_id": "2383cefe8a34ea5810cc0706f2cf8cf08a106f90fc3eb3441f723cecdbe61331",
    "outputs": [
      {
        "address": "sy1q4pkg8msjumtep7ecsdzuct3tsuzk5pnm3p8nr",
        "amount": 624000000000,
        "asset_definition": "7b7d",
        "asset_id":
"ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff",
        "control_program": "0014f3403bcd8b443d03882a280b50f6f98986e1a255",
        "id": "da87b40854a9b93be72ecdc24fe7bb03986ea3530e344b0f918f0788c3d83717",
        "position": 0,
        "type": "control"
      }
    ],
    "size": 77,
    "status_fail": false,
    "time_range": 0,
    "version": 1
  }
],
"version": 1
}

```

## Get Block Header Endpoint

Returns the details of a block header by block height or block hash.

### Parameters

**Object:** `block_height` | `block_hash`

Optional:

- **String** - **block\_hash**, hash of block.
- **Integer** - **block\_height**, height of block.

## Returns

Object:

- **Object** - **block\_header**, header of block.
- **Integer** - **reward**, reward.

## Example

Retrieve the block header details.

### Request

```
curl -X POST http://localhost:9888/get-block-header -d '{"block_height": 43, "block_hash": "886a8e85b275e7d65b569ba510875c0e63dece1a94569914d7624c0dac8002f9"}'
```

### Response

```
{
  "block_header":
  "01019601e87da37e7d73f31d54304c719c9058ec7bc7de7819deda89a7c8834a99bc05b8fbdbe6d60540e
  ba9e5d5cb79fd87b3c0fad32f6772c1e4483f2a070e093a6176d85226d986a8c9c377e5192668bc0a367e4
  a4764f11e7c725ecced1d7b6a492974fab1b6d5bc00ad9184808080801e",
  "reward": 41250000000
}
```

## Get Difficulty Endpoint

Returns the block difficulty by block height or block hash.

### Parameters

Object:

Optional:

- **String** - **block\_hash**, hash of block.
- **Integer** - **block\_height**, height of block.

## Returns

Object:

- **Integer** - **bits**, bits of block.
- **String** - **difficulty**, difficulty of block.
- **String** - **hash**, block hash.
- **Integer** - **height**, block height.

## Example

Get difficulty for specified block hash / height.

### Request

```
curl -X POST http://localhost:9888/get-difficulty -d '{"block_height": 506,
"block_hash": "d1fce60caea5466eae2b812e4586b55120c52aca27b6c92bd7c51e9cda82dcdf"}'
```

### Response

```
{
  "bits": 2161727821137910500,
  "difficulty": "15154807",
  "hash": "d1fce60caea5466eae2b812e4586b55120c52aca27b6c92bd7c51e9cda82dcdf",
  "height": 506
}
```

## Get Hash Rate Endpoint

Returns the block hash rate by block height or block hash, it returns the current block hash rate when request is empty.

### Parameters

**Object:**

**Optional:**

- **String** - **block\_hash**, hash of block.
- **Integer** - **block\_height**, height of block.

### Returns

**Object:**

- **Integer** - **hash\_rate**, difficulty of block.
- **String** - **hash**, block hash.
- **Integer** - **height**, block height.

## Example

Get hash rate for specified block hash / height.

### Request

```
curl -X POST http://localhost:9888/get-hash-rate -d '{"block_height": 506,
"block_hash": "d1fce60caea5466eae2b812e4586b55120c52aca27b6c92bd7c51e9cda82dcdf"}'
```

### Response

```
{
  "hash": "d1fce60caea5466eae2b812e4586b55120c52aca27b6c92bd7c51e9cda82dcdf",
  "hash_rate": 7577403,
  "height": 506
}
```

## Net Info Endpoint

Returns the information for the current network state.

### Parameters

None.

### Returns

Object:

- **Boolean** - **listening**, whether the node is listening.
- **Boolean** - **syncing**, whether the node is syncing.
- **Boolean** - **mining**, whether the node is mining.
- **Integer** - **peer\_count**, current count of connected peers.
- **Integer** - **current\_block**, current block height in the node's blockchain.
- **Integer** - **highest\_block**, current highest block of the connected peers.
- **String** - **network\_id**, network id.
- **Object** - **version\_info**, node's version information:
  - **String** - **version**, current version of the running node.
  - **uint16** - **update**, whether there exists an update.
    - 0: no update;
    - 1: small update;
    - 2: significant update.



- **String** - **new\_version**, the newest version of the **core** if there is one.

## Example

Query the node for it's network state.

### Request

```
curl -X POST http://localhost:9888/net-info
```

### Response

```
{
  "listening": true,
  "syncing": false,
  "mining": false,
  "peer_count": 6,
  "current_block": 33409,
  "highest_block": 33409,
  "network_id": "mainnet",
  "version_info": {
    "version": "1.0.3",
    "update": 0,
    "new_version": "1.0.3"
  }
}
```

## Is Mining Endpoint

Returns the mining status.

### Parameters

None.

### Returns

**Object:**

- **Boolean** - **is\_mining**, whether the node is mining.

## Example

Retrieve the mining status.

## Request

```
curl -X POST http://localhost:9888/is-mining
```

## Response

```
{  
  "is_mining": true  
}
```

# Set Mining Endpoint

Start up node mining.

## Parameters

Object:

- **Boolean** - **is\_mining**, sets the value for the node's mining.

## Returns

Nothing in case the mining has been turned on or off.

## Example

Turn node mining on of off.

## Request

```
curl -X POST http://localhost:9888/set-mining -d '{"is_mining": true}'
```

## Response

Nothing if the operation was successful.

# Gas Rate Endpoint

Query gas rate.

## Parameters

None.

## Returns

### Object:

- **Integer** - **gas\_rate**, gas rate.

## Example

Retrieve the current gas rate.

### Request

```
curl -X POST http://localhost:9888/gas-rate -d '{}'
```

### Response

```
{
  "gas_rate": 1000
}
```

## Verify Message Endpoint

Verify a signed message with derived **pubkey** of the address.

### Parameters

#### Object:

- **String** - **address**, address for account.
- **String** - **derived\_xpub**, derived xpub.
- **String** - **message**, message for signature by derived\_xpub.
- **String** - **signature**, signature for message.

## Returns

### Object:

- **Boolean** - **result**, verify result.

## Example

Given a signed message, verify it's authenticity.

### Request

```
curl -X POST http://localhost:9888/verify-message -d
'{"address":"ey1qx2qgvvjz734ur8x5lpfdtlau74aaa5djs0a5jn",
"derived_xpub":"6ff8c3d1321ce39a3c3550f57ba70b67dcbcef821e9b85f6150edb7f2f3f91009e67f3
075e6e76ed5f657ee4b1a5f4749b7a8c74c8e7e6a1b0e5918ebd5df4d0", "message":"this is a test
message",
"signature":"74da3d6572233736e3a439166719244dab57dd0047f8751b1efa2da26eeab251d915c1211
dcad77e8b013267b86d96e91ae67ff0be520ef4ec326e911410b609"}'
```

## Response

```
{
  "result": true
}
```

# Compile Endpoint

Compile an equity contract.

## Parameters

Object:

- **String** - **contract**, content of equity contract.

Optional:

- **Array of Object** - **args**, parameters of contract.
  - **Boolean** - **boolean**, boolean parameter.
  - **Integer** - **integer**, integer parameter.
  - **String** - **string**, string parameter.

## Returns

Object:

- **String** - **name**, contract name.
- **String** - **source**, source content of contract.
- **String** - **program**, generated program by compiling contract.
- **Array of Object** - **params**, parameters of contract.
- **String** - **value**, locked value name of contract.
- **Array of Object** - **clause\_info**, clauses of contract.
- **String** - **opcodes**, opcodes of contract.
- **String** - **error**, returned error information for compiling contract.

## Example

Given a contract source code, compile it into an equity contract.

### Request

```
curl -X POST http://localhost:9888/compile -d '{"contract": "contract
LockWithPublicKey(publicKey: PublicKey) locks locked { clause unlockWithSig(sig:
Signature) { verify checkTxSi (publicKey, sig) unlock locked }}", "args": [{"string":
"e9108d3ca8049800727f6a3505b3a2710dc579405dde03c250f16d9a7e1e6e78"}]}'
```

### Response

```
{
  "name": "LockWithPublicKey",
  "source": "contract LockWithPublicKey(publicKey: PublicKey) locks locked { clause
unlockWithSig(sig: Signature) { verify checkTxSig(publicKey, sig) unlock locked }}",
  "program":
"20e9108d3ca8049800727f6a3505b3a2710dc579405dde03c250f16d9a7e1e6e787403ae7cac00c0",
  "params": [
    {
      "name": "publicKey",
      "type": "PublicKey"
    }
  ],
  "value": "locked",
  "clause_info": [
    {
      "name": "unlockWithSig",
      "args": [
        {
          "name": "sig",
          "type": "Signature"
        }
      ],
      "value_info": [
        {
          "name": "locked"
        }
      ],
      "block_heights": [],
      "hash_calls": null
    }
  ],
  "opcodes": "0xe9108d3ca8049800727f6a3505b3a2710dc579405dde03c250f16d9a7e1e6e78 DEPTH
0xae7cac FALSE CHECKPREDICATE",
  "error": ""
}
```

# List Peers Endpoint

Returns the list of connected peers.

## Parameters

None.

## Returns

- **Array of Object**, connected peers.
  - **Object**:
    - **String** - **peer\_id**, peer id.
    - **String** - **remote\_addr**, the address(IP and port) of connected peer.
    - **Integer** - **height**, the current height of connected peer.
    - **String** - **ping**, the delay time of connected peer.
    - **String** - **duration**, the connected time.
    - **Integer** - **total\_sent**, total data sent in byte.
    - **Integer** - **total\_received**, total data received in byte.
    - **Integer** - **average\_sent\_rate**, average data sent rate in byte.
    - **Integer** - **average\_received\_rate**, average data received rate in byte.
    - **Integer** - **current\_sent\_rate**, current data sent rate in byte.
    - **Integer** - **current\_received\_rate**, current data received rate in byte.

## Example

Retrieve a list of the connected peers.

## Request

```
curl -X POST http://localhost:9888/list-peers -d '{}'
```

## Response

```
[
  {
    "peer_id": "3B58D7139B53066F2031FC1F027D2B3423FA4CE01F1FB1CC2DC4003C78413C24",
    "remote_addr": "52.83.251.197:46656",
    "height": 84222,
    "ping": "40ms",
    "duration": "17.26s",
    "total_sent": 17565,
```

```
    "total_received":3642187,  
    "average_sent_rate":1018,  
    "average_received_rate":211019,  
    "current_sent_rate":2420,  
    "current_received_rate":157087  
  }  
]
```

## Disconnect Peer Endpoint

Disconnect from the specified peer.

### Parameters

Object:

- **String** - **peer\_id**, peer id.

### Returns

Nothing if peer disconnected successfully.

### Example

Disconnect from a specific peer.

### Request

```
curl -X POST http://localhost:9888/disconnect-peer -d  
'{"peer_id":"29661E8BB9A8149F01C6594E49EA80C6B18BF247946A7E2E01D8235BBBFC3594"}'
```

### Response

Nothing if the operation was successful.

## Connect Peer Endpoint

Connect to specified peer.

### Parameters

Object:

- **String** - **ip**, peer IP address.
- **Integer** - **port**, peer port.

## Returns

Object:

- **String** - **peer\_id**, peer id.
- **String** - **remote\_addr**, the address(IP and port) of connected peer.
- **Integer** - **height**, the current height of connected peer.
- **Integer** - **delay**, the delay time of connected peer.

## Example

Request the node to connect to a specified peer.

### Request

```
curl -X POST http://localhost:9888/connect-peer -d '{"ip":"139.198.177.164",  
"port":46657}'
```

### Response

```
{  
  "peer_id": "29661E8BB9A8149F01C6594E49EA80C6B18BF247946A7E2E01D8235BBBFC3594",  
  "remote_addr": "139.198.177.164:46657",  
  "height": 65941,  
  "delay": 0  
}
```

# Mining Endpoints

These endpoints are for the **CPU** miner.

## Get Work Endpoint

Get the proof of work.

### Parameters

None.

### Returns

Object:

- **Object** - **block\_header**, raw block header.
- **String** - **seed**, seed.



## Example

Request work from the node.

### Request

```
curl -X POST http://localhost:9888/get-work -d '{}'
```

### Response

```
{
  "block_header":
  "0101870103f2c7495164c8f3af43697e81faa21dcb2d60aa5e10ce4f233491e62420742fbeadfc50540b
ef2670a5fade2e58ad4955e2375a04ad1e4cb9c104faddab43f4a79e35be253c9c377e5192668bc0a367e4
a4764f11e7c725ecced1d7b6a492974fab1b6d5bc00ffffff838080808020",
  "seed": "702bef3f1707577fd0d75b6359a2919fa216487fe306771e27710acbaa9164ce"
}
```

## Submit Work Endpoint

Submit the proof of work.

### Parameters

Object:

- **Object** - **block\_header**, raw block header.

### Returns

True if share is correct.

## Example

Submit a share.

### Request

```
curl -X POST http://localhost:9888/submit-work -d '{"block_header":
"0101870103f2c7495164c8f3af43697e81faa21dcb2d60aa5e10ce4f233491e62420742fbeadfc50540b
ef2670a5fade2e58ad4955e2375a04ad1e4cb9c104faddab43f4a79e35be253c9c377e5192668bc0a367e4
a4764f11e7c725ecced1d7b6a492974fab1b6d5bc00ffffff838080808020"}'
```

### Response

true / error

## Get Work JSON Endpoint

Get the proof of work by JSON.

### Parameters

None.

### Returns

Object:

- **Object** - **block\_header**, Object of block header.
  - **Integer** - **version**, version of block.
  - **Integer** - **height**, height of block.
  - **String** - **previous\_block\_hash**, previous block hash.
  - **Integer** - **timestamp**, timestamp of block.
  - **Integer** - **nonce**, nonce value.
  - **Integer** - **bits**, bits of difficulty.
  - **Object** - **block\_commitment**, Object of block commitment.
    - **String** - **transaction\_merkle\_root**, merkle root of transaction.
    - **String** - **transaction\_status\_hash**, merkle root of transaction status.
- **String** - **seed**, seed.

### Example

Request work from the node.

#### Request

```
curl -X POST http://localhost:9888/get-work-json -d '{}'
```

#### Response

```
{
  "block_header": {
    "version": 1,
    "height": 62960,
    "previous_block_hash":
    "dabdb926f8635791ac43f5d5fc62a4597e10e140f00aced3af621a77ead4e9fd",
```

```
"timestamp": 1533006396,  
"nonce": 0,  
"bits": 2017612633069711400,  
"block_commitment": {  
  "transaction_merkle_root":  
    "a13fc86af3852ab73e30c3ae30e8cedbe990560a3c0f20dc37c4c14562b94802",  
  "transaction_status_hash":  
    "c9c377e5192668bc0a367e4a4764f11e7c725ecced1d7b6a492974fab1b6d5bc"  
},  
"seed": "2e2010e11289d6b273b7b1ea947f98cc5ad60d206df184b1501f8ac903fa01a9"  
}
```