**Table 1：Data Query**

| RPC | feature |
| --- | --- |
| whc\_getinfo | Get Wormhole node basic information |
| whc\_getactivecrowd | Get active crowdfunding from a specific address |
| whc\_getallbalancesforaddress | Get all types of token balance from a specific address |
| whc\_getallbalancesforid | Get all address and amount information of the specified token in the wormhole system |
| whc\_getbalance | Get Balance information of a specific token from a specific address |
| whc\_getbalanceshash | Get state hash of specific token at the current height of this node |
| whc\_getcrowdsale | Get detailed information from crowdfunding token |
| whc\_getcurrentconsensushash | Get state hash of Wormhole system at the current height in this node |
| whc\_getgrants | Get additional issuance grants from a specific token, destroy information |
| whc\_getpayload | Get Wormhole payload data from a specific transaction |
| whc\_getproperty | Get information from a specific token |
| whc\_getsto | Get detail information from a specific airdrop transaction |
| whc\_gettransaction | Get Wormhole protocol information from a specific transaction |
| whc\_listblocktransactions | Get Wormhole transaction list from a specific block |
| whc\_listpendingtransactions | Get pending Wormhole transaction list |
| whc\_listproperties | List all tokens in Wormhole system |
| whc\_listtransactions | List Wormhole transactions in node’s wallet |

**whc\_getinfo**

Explanation: Get basic information about the current Wormhole node

Call: wormholed-cli whc\_getinfo

Return value: basic information of the current Wormhole node

Examples are as follows：

wormholed-cli whc\_getinfo

{

"wormholeversion\_int": 6000,

"wormholeversion": "0.0.6",

"bitcoincoreversion": "0.17.2",

"block": 543198,

"blocktime": 1534136847,

"blocktransactions": 0,

"totaltransactions": 1099,

"alerts": [

]

}

Return value field description

• wormholeversion\_int : version of the Wormhole node

• wormholeversion : version of the Wormhole node

• bitcoincoreversion : version of bitcoin-abc

• block : the latest block height of the node   
• blocktime: the latest block timestamp of the node

• blocktransactions : the number of Wormhole transactions contained in the current most recent block

• totaltransactions : the number of all Wormhole transactions in the blockchain at the current height

• alerts : warning message for node rules

**Whc\_getactivecrowd**

Explanation: Get active crowdfunding from a specific address

Call: wormholed-cli whc\_getactivecrowd address

Parameters: address : specific query address

R eturn value

• Return information about the active crowdfunding token when there is an active crowdfunding at this address

• There is no active crowdfunding, return {}. The example is as follows:

wormholed-cli whc\_getactivecrowd qq893ghdg697e5t5anh5fqpxwxxhw3akyu9l7wej0q

{

"propertyid": 168,

"name": "bcext",

"category": "bcext development",

"subcategory": "gcash cashwallet cashutil neutrino",

"data": "contribute to bitcoin-abc",

"url": "https://github.com/bcext",

"precision": 8,

"issuer": "bitcoincash:qq893ghdg697e5t5anh5fqpxwxxhw3akyu9l7wej0q",

"creationtxid": "1f2a39a5fce4e2ce877b611925ef4c6eedb805c1337edd8f1d4bab49e2fe2449",

"totaltokens": "100000000.12345678"

}

Return value field description

• propertyid : tokenID

• name : token name

• category : token category

• subcategory : token subcategory

• data : token information

• url : the URL of the token

• precision : token precision

• issuer : publisher

• creationtxid : create the transaction ID of the token

• totaltokens : total amount of crowdfunding tokens issued

**whc\_getallbalancesforaddress**

Explanation: Get non-zero balance information from all types of tokens at the specified address; no display for tokens with a value of 0

Call: wormholed-cli whc\_getallbalancesforaddress address

Parameters: address : specify query address

Return value

• Return token balance information if the token balance is not 0; otherwise it returns {}.

Examples are as follows:

wormholed-cli whc\_getallbalancesforaddress qr3pzyxl33vdhga54rvh80s62pjznl9eyu9k7q9tmv

[

{

"propertyid": 1,

"balance": "14.00000000",

"reserved": "0.00000000"

},

{

"propertyid": 3,

"balance": "500",

"reserved": "0"

}

]

Return value field description

• propertyid : tokenID

• balance : available balance

• reserved : frozen balance, the current version is not available

**whc\_getallbalancesforid**

Explanation: Get all the addresses in the current blockchain that contain the specified token and the amount information of the token.

Call: wormholed-cli whc\_getallbalancesforid property

Parameters: property : tokenID

Return value

• List of addresses holding that token

Examples are as follows:

wormholed-cli whc\_getallbalancesforid 1

[

{

"address": "bitcoincash:qrpcu87d3y83jg6pjhxrk7ys2225rp9m25nypfvtvk",

"balance": "0.00003000",

"reserved": "0.00000000"

},

{

"address": "bitcoincash:qzf6rh7z40963a9jhh8agmnexw486g205upjjhsfzl",

"balance": "100.00000000",

"reserved": "0.00000000"

}

]

Return value field description

• address : address

• balance : available balance

• reserved : Frozen balance, the current version is not available

**whc\_getbalanceshash**

Description: Return the state hash of the specified token in the system when the current node is at the highest block.

Call：wormholed-cli whc\_getbalanceshash 1

Parameters: specified tokenID

Return value: the existing state hash that the token has in the system

Examples are as follows:

wormholed-cli whc\_getbalanceshash 1

{

"block": 542347,

"blockhash": "000000000000000000f6d63c8adeff1f4bc6fe3618d73f74813c05f08761060a",

"propertyid": 1,

"balanceshash": "f4a051549368b79409b25ad5c3dba4a9e8b0434996d88be8281969f204b35dee"

}

Return value field description

• block : the number of the highest block in the current node

• blockhash : hash of this block

• propertyid : tokenID

• balanceshash : the existing state hash that the token has in the system

**whc\_getbalance**

Description: Return the specific address, and the balance information of a specific token

Call: wormholed-cli whc\_getbalance address propertyid

parameter

• address : the specified address

• propertyid : tokenID

Return value: Amount information of the specified token of the specified address

wormholed-cli whc\_getbalance qqmrktdkuj0qtu0dyef0h2xkn7u6stycuvk70k0ups 1

{

"balance": "5.00000000",

"reserved": "0.00000000"

}

Return value field description

• balance : available balance

• reserved : frozen balance, the current version is not available

**whc\_getcrowdsale**

Description: Get information of the crowdfunding tokens

Call: wormholed-cli whc\_getcrowdsale propertyid (verbose)

parameter:

• propertyid : the ID of the crowdfunding token

• verbose : true, which lists information about crowdfunding participation; false, does not list information about crowdfunding participation

Return value: return information of the crowdfunding token

Examples are as follows:

wormholed-cli whc\_getcrowdsale 168 true

{

"propertyid": 168,

"name": "bcext",

"active": true,

"issuer": "bitcoincash:qq893ghdg697e5t5anh5fqpxwxxhw3akyu9l7wej0q",

"propertyiddesired": 1,

"precision": "8",

"tokensperunit": "1000.11111111",

"earlybonus": 10,

"starttime": 1533266569,

"deadline": 1534733523,

"amountraised": "1.12345000",

"tokensissued": "100000000.12345678",

"addedissuertokens": "0.00000000",

"participanttransactions": [

{

"txid": "ebdc302cddb8fad9e8e11a210af7c01e57b4cf3c883b1ff7d504b4a3791177da",

"amountsent": "1.12345000",

"participanttokens": "1393.76317766"

}

]

}

Return value field description

• propertyid :tokenID

• name :token name

• active: whether crowdfunding is active

• issuer: the issuer of crowdfunding

• propertyiddesired : the tokenID collected

• precision: the precision of the crowdfunding token

• tokensperunit : The single unit price of the crowdfunding token, i.e. 1WHC equals to a certain amount of tokens.

• earlybonus: early bird reward

• starttime : the time when the crowdfunding started

• deadline : the crowdfunding deadline

• amountraised: funds raised

• tokensissued : amount of crowdfunding tokens issued

• addedissuertokens: When crowdfunding is closed, the number of unsold crowdfunding, these amount of tokens will be sent to the issuer's account address

• participanttransactions: information for crowdfunding participants

o txid: transaction ID participating in crowdfunding

o amountsent: the amount of WHC participating in crowdfunding

o participanttokens: the amount of crowdfunding tokens purchased

**whc\_getcurrentconsensushash**

Description: Get the state hash of the current Wormhole system

Call: wormholed-cli whc\_getcurrentconsensushash

Return value: hash of system state

Examples are as follows:

wormholed-cli whc\_getcurrentconsensushash

{

"block": 542354,

"blockhash": "00000000000000000104a3002e3ddf7ccc835751e09ef3335a22078b129c2c71",

"consensushash": "95e4e7fa0d92f84b18ec45ad9b39fdafcc5200ba8175227d7d571864aa5948c9"

}

Return value field description

• block : the number of the highest block in the current node

• blockhash : hash of this block

• consensushash : hash of system state

**whc\_getgrants**

Description: Return the additional issuance of the managable token or destroy information

Call: wormholed-cli whc\_getgrants propertyid

Parameters: tokenID

Return value: Manage the additional or destroy information of the token

Examples are as follows:

wormholed-cli whc\_getgrants 166

{

"propertyid": 166,

"name": "blockchain extension development",

"issuer": "bitcoincash:qpadl79yr4hh0fym4gw73mxp3rm4325knqe7fj6a9s",

"creationtxid": "a82b29d69538268fb67df384b9be7128456724e6fa69e4eb387944cb78ed9d66",

"totaltokens": "0.00000",

"issuances": [

{

"txid":

"grant":

}

{

"txid":

"revoke":

}

]

}

Return value field description

• propertyid : tokenID

• name :token name

• issuer :token issuer

• creationtxid : transaction ID of the creation of the token

• totaltokens : current token circulation supply

• issuances :token management information

o txid : the transaction ID of the additional issuance or destruction

o grant: the amount of additional issued tokens

o revoke: the amount of tokens destroyed

**whc\_getpayload**

Description: Get the Wormhole payload data of the specific transaction

Call: wormholed-cli whc\_getpayload txid

Parameters: transaction ID

Return value: specific data of the specific transaction in Wormhole protocol.

Examples are as follows:

wormholed-cli whc\_getpayload a82b29d69538268fb67df384b9be7128456724e6fa69e4eb387944cb78ed9d66

{

"payload": "00000036010005000000006263657874207265706f7369746f7279006763617368206361736877616c6c657420636173687574696c206e65757472696e6f00626c6f636b636861696e20657874656e73696f6e20646576656c6f706d656e740068747470733a2f2f6769746875622e636f6d2f626365787400666f72207468652066757475726500",

"payloadsize": 136

}

Return value field description

• payload: payload data

• payloadsize : the length of the payload data

**whc\_getproperty**

Description: Get information of the specific token

Call: wormholed-cli whc\_getproperty propertyid

Parameters: tokenID

Return value: detailed information of the token

Examples are as follows:

wormholed-cli whc\_getproperty 168

{

"propertyid": 168,

"name": "bcext",

"category": "bcext development",

"subcategory": "gcash cashwallet cashutil neutrino",

"data": "contribute to bitcoin-abc",

"url": "https://github.com/bcext",

"precision": 8,

"issuer": "bitcoincash:qq893ghdg697e5t5anh5fqpxwxxhw3akyu9l7wej0q",

"creationtxid": "1f2a39a5fce4e2ce877b611925ef4c6eedb805c1337edd8f1d4bab49e2fe2449",

"fixedissuance": false,

"managedissuance": false,

"totaltokens": "100000000.12345678"

}

Return value field description

• propertyid :tokenID

• name :token name

• category : token category

• subcategory : token subcategory

• data : token information

• url : the URL of the token

• precision : token precision

• issuer : publisher

• fixedissuance : whether it is a fixed attribute token

• managedissuance : whether it is a manageable token

• creationtxid : transaction ID of the creation of the token

• totaltokens : total amount of crowdfunding tokens issued

**whc\_getsto**

Description: Get information about airdrops

Call: wormholed-cli whc\_getsto txid recipientfilter

parameter

• txid : the airdrop transaction ID

• recipientfilter: Filter; when the address is specified, only the received airdrop amount information is displayed; when it shows \*, the airdrop amount information received by all accounts will be displayed by default. Return value: Airdrop detailed information

Examples are as follows:

wormholed-cli whc\_getsto 403ec9b6f8b142485ea514d52bc4c782f008021a261f637028a28e1a64681d1b

{

"txid": "403ec9b6f8b142485ea514d52bc4c782f008021a261f637028a28e1a64681d1b",

"fee": "268",

"sendingaddress": "bchtest:qz04wg2jj75x34tge2v8w0l6r0repfcvcygv3t7sg5",

"ismine": false,

"version": 0,

"type\_int": 3,

"type": "Send To Owners",

"propertyid": 12,

"precision": "1",

"amount": "50.0",

"totalstofee": "0",

"recipients": [

],

"valid": false,

"invalidreason": "Unknown error",

"blockhash": "000000000000037252bf77bba30e5599b20239eb8f9f68c8b18c238688a27f6b",

"blocktime": 1531904498,

"positioninblock": 999999,

"block": 1247269,

"confirmations": 3368

}

Return value field description

• txid : the airdrop transaction ID

• fee : BCH transaction fee for the transaction

• sendingaddress : the sender of the airdrop transaction

• ismine : Whether the sending address belongs to the address in the node wallet

• version : the version number of the airdrop type

• type\_int : type of airdrop transaction

• type : airdrop transaction type

• propertyid : the tokenID of the airdrop

• precision: the token precision of the airdrop

• amount : the amount of token of the airdrop

• totalstofee: the transaction fee for this airdrop

• valid : whether it is a valid airdrop transaction

• invalidreason : invalid reason

• blockhash : the block hash where the transaction is located

• blocktime : the timestamp of the block in which the transaction is located

• positioninblock : the index of the transaction in the block

• block : the block number of the transaction

• confirmations : the number of times the transaction was confirmed

• recipients: information about this airdrop receiver

o address : receiving address of this airdrop

o amount : the amount of airdrop received

**whc\_gettransaction**

Description: Get information about Wormhole transactions

Call: wormholed-cli whc\_gettransaction txid

Parameters: transaction ID

Return value: if it is a Wormhole transaction, return its details

Examples are as follows:

wormholed-cli whc\_gettransaction a82b29d69538268fb67df384b9be7128456724e6fa69e4eb387944cb78ed9d66

{

"txid": "a82b29d69538268fb67df384b9be7128456724e6fa69e4eb387944cb78ed9d66",

"fee": "390",

"sendingaddress": "bitcoincash:qpadl79yr4hh0fym4gw73mxp3rm4325knqe7fj6a9s",

"ismine": false,

"version": 0,

"type\_int": 54,

"type": "Create Property - Manual",

"propertyid": 166,

"precision": "5",

"ecosystem": "main",

"category": "bcext repository",

"subcategory": "gcash cashwallet cashutil neutrino",

"propertyname": "blockchain extension development",

"data": "for the future",

"url": "https://github.com/bcext",

"amount": "0.00000",

"valid": true,

"blockhash": "0000000000000000009179a89e5ef71fabac5404c61a11cc60a21c1d6caefb7e",

"blocktime": 1533194387,

"positioninblock": 1553,

"block": 541634,

"confirmations": 729

}

Return value field description

• txid : transaction ID

• fee : BCH transaction fee for the transaction

• sendingaddress : the sender of the transaction

• ismine : Whether the sending address belongs to the address in the node wallet

• version : version number of the Wormhole type

• type\_int : transaction type of Wormhole

• wormholed-cli : Wormhole transaction type

• propertyid : if the transaction is a token issuance type, identify the tokenID

• precision : precision

• ecosystem : the ecosystem in which the token is located

• category : created token category

• amount : the amount of tokens created

• valid : whether the Wormhole transaction is valid

• blockhash : the block hash where the transaction is located

• blocktime : the timestamp of the block in which the transaction is located

• positioninblock : the index of the transaction in the block

• block : the block number of the transaction

• confirmations : the number of times the transaction was confirmed

**whc\_listblocktransactions**

Description: return all Wormhole transactions in the specific block

Call: wormholed-cli whc\_listblocktransactions blockHeight

Parameter: block number

Return value: Wormhole transaction hash list

Examples are as follows:

wormholed-cli whc\_listblocktransactions 541634

[

"599e5126759a98c977fce4056b14628f4e175d757d090ed11809c9f0474e6d55",

"fa072ca373c6a38248207eab6a4e85933792628188f6ba6eb99a0fa719d8e808",

"ec451d67689ed2d990652a013b1af87edce694f5675c11b5063c89889f5fa8ed",

"548a10ca6c0b36bed39a78e4d47636fa16ccd3b9ba0dadb5882deb4933f83336",

"72d266f60e6c7ddb64b5009b59bc263da4ee1be89257b1fd1625a3c674b23795",

"a82b29d69538268fb67df384b9be7128456724e6fa69e4eb387944cb78ed9d66",

"0956f48b0b097df6d3aa2d34acfe75a362a185fdfe32f90b5683f178558d5569"

]

**whc\_listpendingtransactions**

Description: Query the unconfirmed Wormhole transaction in the node transaction pool

Call: wormholed-cli whc\_listpendingtransactions address

Parameter: Filter address

Return value: Unconfirmed transaction information list of the specific address

Examples are as follows:

wormholed-cli whc\_listpendingtransactions qpadl79yr4hh0fym4gw73mxp3rm4325knqe7fj6a9s

[

]

**whc\_listproperties**

Description: List all token information in the entire system

Call: wormholed-cli whc\_listproperties

Return value: list of all tokens in the system

Examples are as follows:

wormholed-cli whc\_listproperties

[

{

"propertyid": 1,

"name": "WHC",

"category": "N/A",

"subcategory": "N/A",

"data": "WHC serve as the binding between Bitcoin cash, smart properties and contracts created on the Wormhole.",

"url": "http://www.wormhole.cash",

"precision": 0

},

{

"propertyid": 3,

"name": "BFT",

"category": "BitApp",

"subcategory": "Blockchain",

"data": "BitApp Founder Token",

"url": "ht\ntps://www.bitapp.pro",

"precision": 0

},

{

"propertyid": 4,

"name": "WHD",

"category": "group",

"subcategory": "coprenet",

"data": "the mainnet token issued",

"url": "www.wormhole.cash",

"precision": 8

}

]

**whc\_listtransactions**

Description: List all transaction information on the blockchain related to the current node wallet address

Call: wormholed-cli whc\_listtransactions (address, count, skip, startblock, endblock)

Parameters: all parameters of the RPC are available

• address : filtered address

• count : the number of transactions acquired

• skip : skip the first n transactions

• startblock: the block number at the beginning of the transaction

• endblock: the block number at the end of the transaction

Return value: List of transaction information

Examples are as follows:

wormholed-cli whc\_listtransactions qz04wg2jj75x34tge2v8w0l6r0repfcvcygv3t7sg5

[

]

**Create transaction**

The following two solutions are used to create a transaction.

Solution 1: Call the RPC in Table 2 to create a Wormhole transaction directly; this series of RPC calls have the following requirements for the node:

• Require the Wormhole node to have a wallet that can be used

• There must be enough BCH and WHC in the wallet for creating transactions

• The advantage: the calling API is simple and can be used directly by users in the node

• The disadvantage: there must be a wallet that has BCH and WHC in the current node.

Solution 2: Create Wormhole transactions through the combined calling of Table 3 and Table 4 of RPC

• This calling scheme can be used to develop applications such as wallets, by calling the server-side RPC service, it will generate unsigned transactions; then the wallet will sign and send the signed transaction.

• The advantage: do not require the calling node to have a wallet, the loss of the token is not a problem; allow offline signature, and broadcasting of transactions

• The disadvantage: the calling process is a complicated

**Table 2：Create Wormhole transaction**

| **RPC** | **feature** |
| --- | --- |
| whc\_burnbchgetwhc | Burn BCH，get WHC |
| whc\_sendissuancefixed | Issue fixed token |
| whc\_sendissuancemanaged | Issue manageable token |
| whc\_sendissuancecrowdsale | Issue crowdfunding token |
| whc\_particrowsale | Participate in crowdfunding |
| whc\_sendclosecrowdsale | Close crowdfunding |
| whc\_sendgrant | Issue additional amount of manageable token |
| whc\_sendrevoke | Destroy amount of manageable token |
| whc\_send | transfer |
| whc\_sendsto | airdrop |
| whc\_sendall | Send all tokens in a specific address to another address |
| whc\_sendchangeissuer | Change token issuer |

**whc\_burnbchgetwhc**

Description: Burn BCH, get WHC

Call: wormholed-cli whc\_burnbchgetwhc "amount" (redeemaddress)

parameter

• amount : the amount of BCH burned

• redeemaddress: redundant BCH redemption address; optional: the default wallet generates a new address.

Return value: generate transaction hash

Examples are as follows:

wormholed-cli whc\_burnbchgetwhc 1.5

153438e063d2533f6337d86b9ab7494cf907c4e927c3cef7a9358504cb049cf6

**whc\_sendissuancefixed**

Description: Issue a fixed attribute token

Call: wormholed-cli whc\_sendissuancefixed "fromaddress" ecosystem precision previousid "category" "subcategory" "name" "url" "data" "totalNumber"

Parameter

• fromaddress : the address that issued the fixed attribute token

• ecosystem :token ecosystem; currently must be 1

• precision : the precision of the token

• previousid : the tokenID that being added value; currently must be 0

• category :token category

• subcategory : subcategory of token

• name : the name of the token

• url : token URL

• data: custom description data for token

• totalNumber : the amount of issued tokens

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_sendissuancefixed qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 1 3 0 "company" "compute" "luzhiyao" "www.ludete.com" "hello world" 10082936279.232

1d059313c873018a2f0dfe855ba1dde0ce19ec50db51eca42236baa1b8c8d6f4

**whc\_sendissuancemanaged**

Description: Issue manageable tokens

Call: wormholed-cli whc\_sendissuancemanaged "fromaddress" ecosystem precision previousid "category" "subcategory" "name" "url" "data"

parameter

• fromaddress : the address from which the manageable token is issued

• ecosystem :token ecosystem; currently must be 1

• precision : the precision of the token

• previousid : the tokenID that being added value; currently must be 0

• category :token category

• subcategory : subcategory of token

• name : the name of the token

• url :token URL

• data: custom description data for token

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_sendissuancemanaged qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 1 3 0 "company" "compute" "luzhiyao" "www.ludete.com" "hello world"

ae878af640344f3c8fae85ed4d37eb0f2a77a2553a0cb7645ff7c92d23d89768

**whc\_sendissuancecrowdsale**

Description: Issue a crowdfunding token

Call: wormholed-cli whc\_sendissuancecrowdsale "fromaddress" ecosystem precision previousid "category" "subcategory" "name" "url" "data" propertyiddesired tokensperunit deadline earlybonus undefine totalNumber

parameter

• fromaddress : the address from which the manageable token is issued

• ecosystem :token ecosystem; currently must be 1

• precision : the precision of the token

• previousid : the tokenID that being added value; currently must be 0

• category :token category

• subcategory : subcategory of token

• name : the name of the token

• url :token URL

• custom description data for data :token

• propertyiddesired : the tokenID attending the fundraising

• tokensperunit: the single unit price of the crowdfunding token; 1WHC is equal to a certain ratio of tokens, the range of unit price [10-8, 108]

• deadline : deadline for crowdfunding

• earlybonus: early bird reward

• undefine : undefined field, must be 0

• totalNumber : the amount of crowdfunding issuance

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_sendissuancecrowdsale qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 1 3 0 "company" "compute" "luzhiyao" "www.ludete.com" "hello world" 1 1002 1536565622 1 0 21231242131

e7d2c232a91a3c1855cbfed05bf75e31041676898b37fa93420308cb3ff7a666

**whc\_particrowsale**

Description: Participate in crowdfunding

Call: wormholed-cli whc\_particrowsale "fromaddress" "toaddress" "amount" ( "redeemaddress" "referenceamount" )

parameter

• fromaddress : the address to participate in crowdfunding

• toaddress : the address of the crowdfunding issuer

• amount : the amount of WHC participating in crowdfunding

• redeemaddress : the address for redeeming the extra BCH; optional, the default is the address that participates in crowdfunding

• referenceamount : the amount of BCH given to the crowdfunding issuer; optional, the default is the minimum amount of the system

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_particrowsale qpalmy832fp9ytdlx444sehajljnm554dulckcvjl5 qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 100

d0a21fd05ed0e2f23f594d77b8ecec96a94ad1dec2785b658e4f705504766cda

**whc\_sendclosecrowdsale**

Description: Turn off crowdfunding

Call: wormholed-cli whc\_sendclosecrowdsale "fromaddress" propertyid

parameter:

• fromaddress : the address of the crowdfunding issuer

• propertyid : the tokenID of the crowdfunding

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_sendclosecrowdsale qpalmy832fp9ytdlx444sehajljnm554dulckcvjl5 11

967328ba4b60876e0b1039e7e4ac77c2d7678ac98e968599786a68df18f353cf

**whc\_sendgrant**

Description: The amount of additional issued manageable tokens

Call: wormholed-cli whc\_sendgrant "fromaddress" "toaddress" propertyid "amount" ( "memo" )

parameter:

• fromaddress :token issuer address

• toaddress : add specific amount of tokens to this address

• propertyid : manageable tokenID

• amount : the amount of additional issued tokens

• memo: custom information for additional issued tokens

Return value: generated transaction hash

Examples are as follows：

wormholed-cli whc\_sendgrant qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq qpalmy832fp9ytdlx444sehajljnm554dulckcvjl5 115 1242

ed76f90ef3950cac5198045a009483dc90d3ce8a4c8d491d86127b1b3f55a555

**whc\_sendrevoke**

Description: The number of destroyed management tokens

Call: wormholed-cli whc\_sendrevoke "fromaddress" propertyid "amount" ( "memo" )

parameter:

• fromaddress :token issuer address

• propertyid : manageable tokenID

• amount : the number of tokens destroyed

• memo: custom information of the destroyed token

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_sendrevoke qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 115 100

91c56172524fe11fabb7f954cf893a7c42be31e79f549031d11b89a5ea7d4581

**whc\_send**

Description: Transfer

Call: wormholed-cli whc\_send "fromaddress" "toaddress" propertyid "amount" ( "redeemaddress" "referenceamount" )

parameter:

• fromaddress : the sender address of the token

• toaddress : the recipient address of the token

• propertyid : the tokenID of the transfer

• amount : the amount of tokens transferred

• redeemaddress : the BCH redeem address; optional, the default is the address of the token sender

• referenceamount :token the amount of BCH output by the receiver; optional, the default is the minimum amount of the system

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_send qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq qpalmy832fp9ytdlx444sehajljnm554dulckcvjl5 115 100

d87ae34ed64e23087228eba458af1ebaf94f0db04912c59f6531f2b8c5c72f91

**whc\_sendsto**

Description: Airdrop

Call: wormholed-cli whc\_sendsto "fromaddress" propertyid "amount" ( "redeemaddress" distributionproperty )

parameter:

• fromaddress : the sender address of the airdrop

• propertyid : the tokenID of the airdrop

• amount : the amount of tokens being airdropped

• redeemaddress : the BCH redeem address; optional, the default is the address of the token sender

• distributionproperty : the target tokenID that receives the airdrop; optional, the default is the ID that airdrop tokens

Return value: generated transaction hash

Examples are as follows：

wormholed-cli whc\_sendsto qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 115 1000 qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 1

bf3d30fc9c9424bdc6e38fc55320bad6cda9488e74296fc8dfb06cb2d9ee0fd9

**whc\_sendall**

Description: Send all tokens of the specific address to another address

Call: wormholed-cli whc\_sendall "fromaddress" "toaddress" ecosystem ( "redeemaddress" "referenceamount" )

parameter:

• fromaddress :token sender address

• toaddress :token recipient address

• ecosystem: ecosystem; currently must be 1

• redeemaddress : the BCH redeem address; optional, the default is the address of the token sender

• referenceamount : the amount of BCH output by the token receiver; optional, the default is the minimum amount of the system

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_sendall qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq qpalmy832fp9ytdlx444sehajljnm554dulckcvjl5 1

cb93fbe852955201b757a790a73bb964728dd4309a449b2e46e67c9f69292909

**whc\_sendchangeissuer**

Description: Change the issuer of the token

Call: wormholed-cli whc\_sendchangeissuer "fromaddress" "toaddress" propertyid

parameter:

• fromaddress :token issuer

• toaddress : the modified issuer

• propertyid : tokenID

Return value: generated transaction hash

Examples are as follows:

wormholed-cli whc\_sendchangeissuer qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq qpalmy832fp9ytdlx444sehajljnm554dulckcvjl5 115

d1fb2ee670e3489e80f9fbfbd9e001dfb4ed64d5107354e7b74ceb0398625fb1

**Table 3 ：Create Wormhole protocol payload data**

| **RPC** | **feature** |
| --- | --- |
| whc\_createpayload\_burnbch | Burn BCH, get WHC |
| whc\_createpayload\_issuancefixed | Issue fixed token |
| whc\_createpayload\_issuancemanaged | Issue manageable token |
| whc\_createpayload\_issuancecrowdsale | Issue crowdfunding token |
| whc\_createpayload\_particrowdsale | Participate crowdfunding |
| whc\_createpayload\_closecrowdsale | Close crowdfunding |
| whc\_createpayload\_grant | Additionally issued amount of manageable token |
| whc\_createpayload\_revoke | Destroyed amount of manageable token |
| whc\_createpayload\_simplesend | transfer |
| whc\_createpayload\_sto | airdrop |
| whc\_createpayload\_sendall | Send all tokens from a specific address to another address |
| whc\_createpayload\_changeissuer | Change the issuer of token |

**whc\_createpayload\_burnbch**

Description : burn BCH, get WHC

Transfer：wormholed-cli whc\_createpayload\_burnbch

Return value: created wormhole protocol payload data

Example is as follows:

wormholed-cli whc\_createpayload\_burnbch

00000044

**whc\_createpayload\_issuancefixed**

Description: issue fixed token

Transfer：wormholed-cli whc\_createpayload\_issuancefixed ecosystem precision previousid "category" "subcategory" "name" "url" "data" "totalNumber"

parameter

* Ecosystem: token ecosystem; currently must be 1
* precision: precision of token
* previousid: value attached tokenID; currently must be 0
* category: category of token
* subcategory: subcategory of token
* name: name of token
* url: URL of token URL
* data: self-defined token description data
* totalNumber: number of token issued

Return value: Created wormhole protocol payload data

Example is as follows

wormholed-cli whc\_createpayload\_issuancefixed 1 3 0 "company" "compute" "luzhiyao" "www.ludete.com" "hello world" 10082936279.232

0000003201000300000000636f6d70616e7900636f6d70757465006c757a686979616f007777772e6c75646574652e636f6d0068656c6c6f20776f726c64000000092b9dd5d0c0

**whc\_createpayload\_issuancemanaged**

Description: Issue manageable token

Transfer：wormholed-cli whc\_createpayload\_issuancemanaged ecosystem precision previousid "category" "subcategory" "name" "url" "data"

parameter

* ecosystem: ecosystem of token; currently must be 1
* precision: precision of token
* previousid : value attached tokenID; currently must be 0
* category: token category
* subcategory: token subcategory
* name: token name
* url: token URL
* data: self-defined token memo
* Return value：Created transaction hashes

Example is as follows:

wormholed-cli whc\_createpayload\_issuancemanaged 1 3 0 "company" "compute" "luzhiyao" "www.ludete.com" "hello world"

0000003601000300000000636f6d70616e7900636f6d70757465006c757a686979616f007777772e6c75646574652e636f6d0068656c6c6f20776f726c6400

**whc\_createpayload\_issuancecrowdsale**

Description: issue crowdfunding token

Transfer：wormholed-cli whc\_createpayload\_issuancecrowdsale ecosystem precision previousid "category" "subcategory" "name" "url" "data" propertyiddesired tokensperunit deadline earlybonus undefine totalNumber

parameter

* Ecosystem: token ecosystem; currently must be 1
* Precision: token precision
* Previousid: value attached tokenID; currently must be 0
* Category: token category
* subcategory: token subcategory
* name: token name
* url: token URL
* data: token self-defined description data
* propertyiddesired: crowd funded tokenID
* tokensperunit: token price per unit; 1=how many token, price range of per token [10-8, 108]
* deadline: crowdfunding deadline
* earlybonus: early bird bonus
* undefined: undefined unit, must be 0
* totalNumber: total number of token

Return value：Created transaction hash

Example is as follows:

wormholed-cli whc\_createpayload\_issuancecrowdsale 1 3 0 "company" "compute" "luzhiyao" "www.ludete.com" "hello world" 1 1002 1536565622 1 0 21231242131

0000003301000300000000636f6d70616e7900636f6d70757465006c757a686979616f007777772e6c75646574652e636f6d0068656c6c6f20776f726c640000000001000000175462aa00000000005b96217601000000134f48a53638

**whc\_createpayload\_particrowdsale**

Description : participate crowdfunding

Transfer：wormholed-cli whc\_createpayload\_particrowdsale "amount"

parameter

* amount: amount of WHC for crowdfunding

Return value：Created transaction hashes

Example is as follows:

wormholed-cli whc\_createpayload\_particrowdsale 100

000000010000000100000002540be400

**whc\_createpayload\_closecrowdsale**

Description: close crowdfunding

Transfer：wormholed-cli whc\_createpayload\_closecrowdsale propertyid

parameter：

* propertyid: crowdfunding tokenID

Return value：Created transaction hashes

Example is as follows:

wormholed-cli whc\_createpayload\_closecrowdsale 11

000000350000000b

**whc\_createpayload\_grant**

Description: amount of additionally issued manageable token

Transfer：wormholed-cli whc\_createpayload\_grant propertyid "amount" ( "memo" )

parameter：

* propertyid: manageable token ID
* amount: additionally issued token amount
* memo: additionally issued token memo

Return value：Created transaction hash

Example is as follows:

wormholed-cli whc\_createpayload\_grant 115 1242

0000003700000073000000000012f39000

**whc\_createpayload\_revoke**

Description: revoked manageable token amount

Transfer：wormholed-cli whc\_createpayload\_revoke propertyid "amount" ( "memo" )

parameter：

* propertyid: manageable token ID
* amount: destroyed token amount
* memo: destroyed token memo

Return value：Created transaction hash

Example is as follows

wormholed-cli whc\_createpayload\_revoke 115 100

000000380000007300000000000186a000

**whc\_createpayload\_simplesend**

Description: transfer

Transfer：wormholed-cli whc\_createpayload\_simplesend propertyid "amount"

parameter：

* fromaddress： token’s sender address
* toaddress：toke’s receiver address
* propertyid: transfer tokenID
* amount: transfer token amount
* redeemaddress: BCH redeem address; optional, the default is the address of token sender
* referenceamount: BCH amount of token receiver; optional, the default is the minimum amount in the system
* Return value：Created transaction hash

Example is as follows

wormholed-cli whc\_createpayload\_simplesend 115 100

000000000000007300000000000186a0

**whc\_createpayload\_sto**

Description: airdrop

Transfer：wormholed-cli whc\_createpayload\_sto propertyid "amount" distributionpropertyß

parameter：

* Fromaddress: airdrop token sender address
* Propertyid: airdrop property token ID
* Amount: airdrop token amount
* Redeemaddress: BCH redeem address; optional, the default is the token sender address
* Distributionproperty: airdrop target token ID; optional, the default is the airdrop token ID
* Return value：Created transaction hash

Example is as follows

wormholed-cli whc\_createpayload\_sto 115 1000 1

000000030000007300000000000f424000000001

**whc\_createpayload\_sendall**

Description: send all token from a specific address to another address

Transfer：wormholed-cli whc\_createpayload\_sendall ecosystem

parameter：

* Ecosystem: ecosystem, currently must be 1
* Redeemaddress: BCH redeem address; optional, the default is the token sender address
* Referenceamount: token receiver BCH amount; optional, the default is the minimum amount of the system

Return value：Created transaction hash

Example is as follows

wormholed-cli whc\_createpayload\_sendall 1

0000000401

**whc\_createpayload\_changeissuer**

Description: change token issuer

Transfer：wormholed-cli whc\_createpayload\_changeissuer propertyid

parameter：

* Fromaddress: token sender
* Toaddress: sender after change
* Propertyid:tokenID

Return value：Created transaction hashes

Example is as follows

wormholed-cli whc\_createpayload\_changeissuer 115

0000004600000073

**Table 4: Create Transaction**

| **RPC** | **feature** |
| --- | --- |
| whc\_createrawtx\_input | Append a transaction input to an unsigned transaction |
| whc\_createrawtx\_opreturn | Append the payload data of the Wormhole protocol as a new output script to the unsigned transaction |
| whc\_createrawtx\_reference | Append a transaction output to an unsigned transaction |
| whc\_createrawtx\_change | Append a transaction output to the specified location of the unsigned transaction output collection |
| whc\_decodetransaction | Parse the original transaction of the Wormhole |

**whc\_createrawtx\_input**

Description: Append a transaction output to an unsigned transaction

Transfer：wormholed-cli whc\_createrawtx\_input "rawtx" "txid" c

Parameter：

* Rawtx: unsigned transaction, can be NULL
* Txid: transaction ID
* Txid: To spend the output index of the transaction (txid)

Return Value: add after transaction data after transaction

Example is as follows

wormholed-cli whc\_createrawtx\_input "" "d1fb2ee670e3489e80f9fbfbd9e001dfb4ed64d5107354e7b74ceb0398625fb1" 2

0200000001b15f629803eb4cb7e7547310d564edb4df01e0d9fbfbf9809e48e370e62efbd10200000000ffffffff0000000000

**whc\_createrawtx\_opreturn**

Description: Append the payload data of the Wormhole protocol as a new output script to the unsigned transaction

Transfer：wormholed-cli wormhole "rawtx" "payload"

Parameter：

* Rawtx: Unsigned transaction, can be NULL
* Payload: payload data of the Wormhole protocol

Return Value: add after transaction data after transaction

Example is as follows

wormholed-cli whc\_createrawtx\_opreturn 0200000001b15f629803eb4cb7e7547310d564edb4df01e0d9fbfbf9809e48e370e62efbd10200000000ffffffff0000000000 0000004600000073

0200000001b15f629803eb4cb7e7547310d564edb4df01e0d9fbfbf9809e48e370e62efbd10200000000ffffffff0100000000000000000e6a0c08776863000000460000007300000000

**whc\_createrawtx\_reference**

Description: Append a transaction output to an unsigned transaction

Transfer：wormholed-cli whc\_createrawtx\_reference "rawtx" "destination" ( amount )

Parameter：

* rawtx: unsigned transaction, can be NULL
* destination: The destination address where the output will be added：
* amount: The amount of the output; optional, the default is the minimum amount of the system

Return Value: add after transaction data after transaction

Example is as follows

wormholed-cli whc\_createrawtx\_reference 0200000001b15f629803eb4cb7e7547310d564edb4df01e0d9fbfbf9809e48e370e62efbd10200000000ffffffff0100000000000000000e6a0c08776863000000460000007300000000 qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq 1.24

0200000001b15f629803eb4cb7e7547310d564edb4df01e0d9fbfbf9809e48e370e62efbd10200000000ffffffff0200000000000000000e6a0c08776863000000460000007300176407000000001976a9149e763b620e844d5e926206ba534d2a4b979fb15188ac00000000

**whc\_createrawtx\_change**

Description: Append a transaction output to the specified location of the unsigned transaction output collection

Transfer：wormholed-cli whc\_createrawtx\_change "rawtx" "prevtxs" "destination" fee ( position )

Parameter：

* rawtx: unsigned transaction, can be NULL
* prevtxs: Reference input set for unsigned transactions
* destination: The destination address where the output will be added
* fee: Transaction fee
* position: Append this transaction output to the specified location of the output collection; optionally, the default is appended to the position where the index is 0.

Return Value: add after transaction data after transaction

Example is as follows

wormholed-cli whc\_createrawtx\_change "0100000001b15ee60431ef57ec682790dec5a3c0d83a0c360633ea8308fbf6d5fc10a779670400000000ffffffff025c0d00000000000047512102f3e471222bb57a7d416c82bf81c627bfcd2bdc47f36e763ae69935bba4601ece21021580b888ff56feb27f17f08802ebed26258c23697d6a462d43fc13b565fda2dd52aeaa0a0000000000001976a914946cb2e08075bcbaf157e47bcb67eb2b2339d24288ac00000000" "[{\"txid\":\"6779a710fcd5f6fb0883ea3306360c3ad8c0a3c5de902768ec57ef3104e65eb1\",\"vout\":4,\"scriptPubKey\":\"76a9147b25205fd98d462880a3e5b0541235831ae959e588ac\",\"value\":0.00068257}]" "qz08vwmzp6zy6h5jvgrt556d9f9e08a32y5eqaqztq" 0.00003500 1

0100000001b15ee60431ef57ec682790dec5a3c0d83a0c360633ea8308fbf6d5fc10a779670400000000ffffffff035c0d00000000000047512102f3e471222bb57a7d416c82bf81c627bfcd2bdc47f36e763ae69935bba4601ece21021580b888ff56feb27f17f08802ebed26258c23697d6a462d43fc13b565fda2dd52aeefe40000000000001976a9149e763b620e844d5e926206ba534d2a4b979fb15188acaa0a0000000000001976a914946cb2e08075bcbaf157e47bcb67eb2b2339d24288ac00000000