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UDPN PoC #6

User Manual for Enabling Gasless Transactions
Using Public Chain-based Stablecoins



Version 1.0.0

PREPARED BY RED DATE TECHNOLOGY LIMITED

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Document Revisions

Date	Revision	Modifications	Modified by
May. 30, 2023	1.0.0	Document creation	Xu Miaomiao

1. General Introduction

This use case demonstrates how a business can allow its customers to make payments in public chain-based regulated stablecoins, using the UDPN infrastructure, without holding and using the public chains' native cryptocurrencies. The basic process is that the business pays for the gas costs with its own cryptocurrency wallets, adds the costs into its customers' total payments in stablecoins, then processes the payments. The entire process, including calculating the gas costs, signing cryptocurrency transactions, and performing the meta transactions on public chains, goes through the UDPN infrastructure and related APIs on the locally installed and open-source UDPN Business Node.

Please note that this solution only applies to the stablecoins on public chains associated with cryptocurrencies. It is expected that most CBDCs and stablecoins on non-cryptocurrency public chains won't require this solution.

2. Home

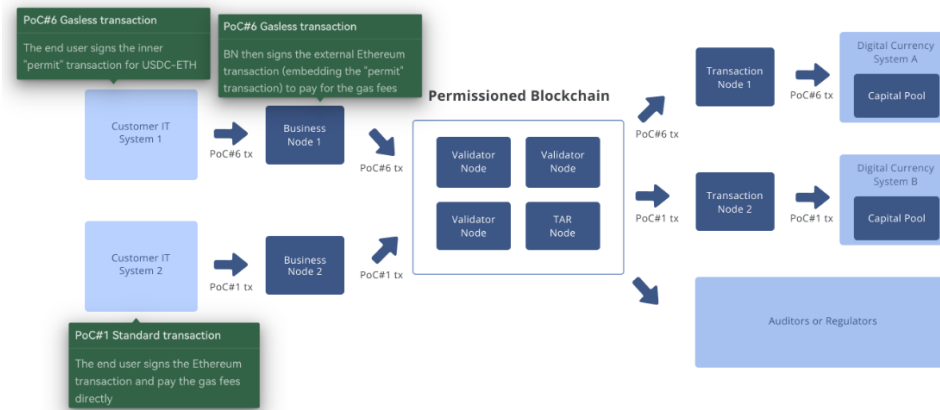
You can view detailed description information of PoC6 and the transaction flow architecture diagram of PoC6. In order to better understand the transaction process of PoC6, the transaction process of PoC1 is also displayed.

UDPN Use Case #6: Enabling Gasless Transactions Using Public Chain-based Stablecoins

This use case demonstrates how a business can allow its customers to make payments in public chain-based regulated stablecoins, using the UDPN infrastructure, without holding and using the public chains' native cryptocurrencies. The basic process is that the business pays for the gas costs with its own cryptocurrency wallets, adds the costs into its customers' total payments in stablecoins, then processes the payments. The entire process, including calculating the gas costs, signing cryptocurrency transactions, and performing the meta transactions on public chains, goes through the UDPN infrastructure and related APIs on the locally installed and open-source UDPN Business Node.

Please note that this solution only applies to the stablecoins on public chains associated with cryptocurrencies. It is expected that most CBDCs and stablecoins on non-cryptocurrency public chains won't require this solution.

The following is the specific architecture diagram:



3. Initiate Transfer

Users can initiate a transfer by entering the Send Account, Currency Type, Send Amount of the sender and the Beneficiary Account, Beneficiary Name of the beneficiary.

Home -> Initiate transfer

Sender's Information

*Send Account:

*Currency Type:

*Send Amount:

Beneficiary's Information

*Beneficiary Account:

Beneficiary Name(Optional):

After clicking the "Next" button, you can select the TN node to execute this transfer

transaction and simulate the end user clicking the "Simulate signing" button to sign:

Home -> Initiate transfer

Available Transaction Nodes

TN Name	TN Code	Send Account	Currency Type	Amount(USDC-ETH)	Beneficiary Account	Beneficiary Name	IsKYC	Action
TN-1	TN20220407000001	0x324235345345345345	USDC-ETH	100	0x3242353453453411111	zhangsan	No	simulate signing(end-user)
TN-3	TN20220407000003	0x324235345345345345	USDC-ETH	100	0x3242353453453411111	zhangsan	Yes	simulate signing(end-user)
TN-4	TN20220407000004	0x324235345345345345	USDC-ETH	100	0x3242353453453411111	zhangsan	No	simulate signing(end-user)

x items found, display x to x

Simulated Signature

Transfer

```

{
  "message": {
    "TN Code": "TN00000975",
    "Amount": 20.000,
    "sourceAccountAddress": "0x4365d3B5FAc9d758492C6F5269b9319271E149AB",
    "sourceCurrencyType": "USDC/ETH",
    "TotalAmount": 20.000,
    "targetAccountAddress": "0x1115C664C7496C28EE5F31802FF00D5C392E46A3",
    "userId": "did:udp:38vtqtpac06VeSEw0KE21hseV8",
    "isKYC": "Yes"
  }
}

```

Private Key* :

Note: UDPN sandbox connect to public chain test network only, hence please use private key of TEST account to sign the transaction and DO NOT use real private key here.

Cancel

Sign and Submit

In the pop-up [Simulated Signature] page, the Transfer transaction message will be displayed. After confirming that it is correct, you can simulate the end user using the private key to sign the transaction message.

Click the "Sign and Submit" button, the BN backend will call the smart contract to complete the authorization operation to deduct the gas fee from its e-wallet. The gas fee spent in the subsequent Transfer transaction will be paid by the BN node.

Simulated Signature

UDPN is preparing to call the USDC transaction (0x4654657874545646000099999) of Ethereum Goerli test network.

BN will use BN's electronic wallet (0x22222225555666587877444555566) to sign this transaction and pay a gas fee (approximately 0.02 ETH).

BN will charge end users 1 USDC-ET to offset this gas fee at the end of the month.

Confirm



Click the "Detail" button in the list to view the Transfer transaction details:

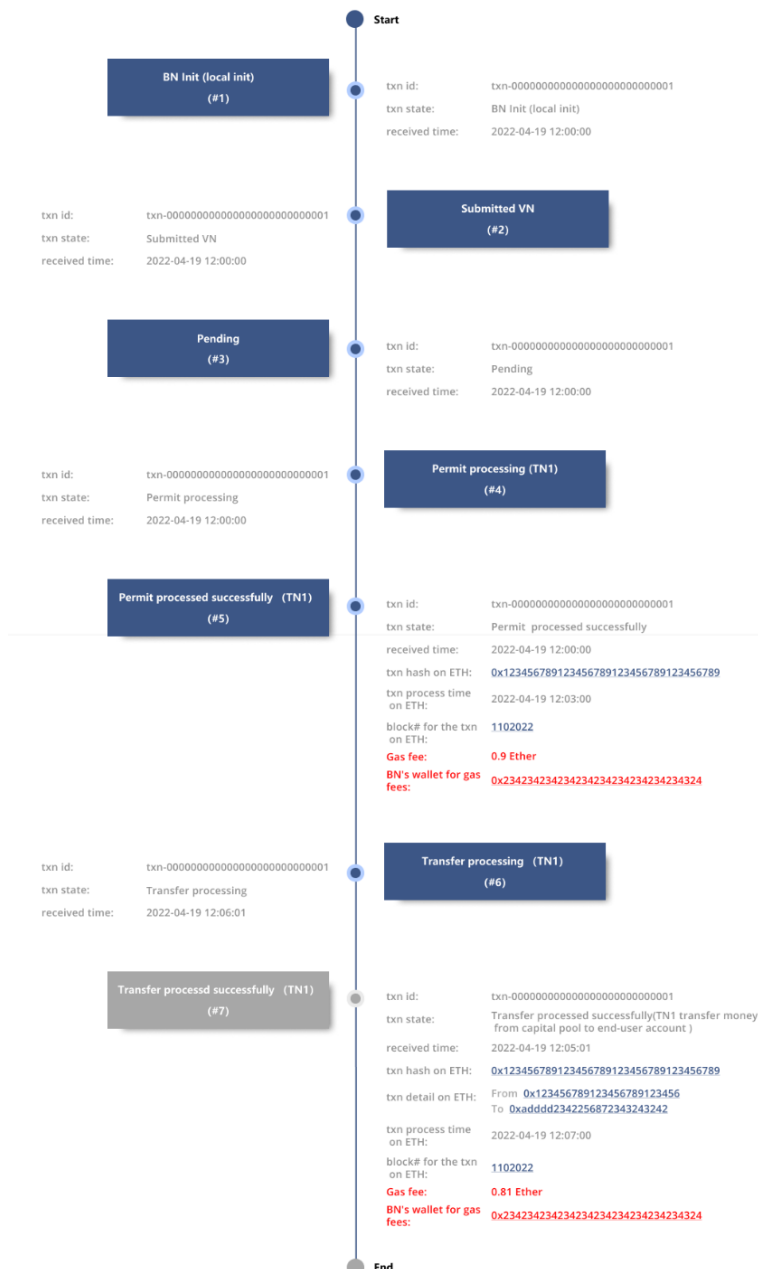
Home -> Transaction Query -> Detail

Basic Information

Transaction Key: 232332202110280004	TN Name: name1
TN Code: TN20220407000001	Currency Type: USDC-ETH
Amount: 5USDC	
Send Account: 0xadddd23423423423423424	Beneficiary Account: 0xadddd234225687234324324
Beneficiary Name: name1	Received Amount: 5USDC
Submission Time: 2021-10-25 10:34:12	Status: TN1 processed successfully
IsKYC: Yes	BN's wallet for gas fees: 0xadddd234225687234324000

Circulation Information

State machine of a normal transfer transaction



Click the BN paid wallet address, transaction hash, source account address,

destination account address and block number in the transfer transaction state machine to jump to the Ethereum browser to query the transaction.

5. VN Node->Transactions Search

The VN administrator can query the Transfer transaction currently being processed by VN on the VN side.

Enter BN Name, Transaction Key, Send Account, Currency Type, Beneficiary Account, Submission Date, Status and other query conditions to query Transfer transaction information.

Txns Query

BN Name:

Transaction Key:

Send Account:

Currency Type:

Beneficiary Account:

Submission Date: To

Status:

List

BN Name	Transaction Key	Send Account	Currency Type	Amount	Beneficiary Account	Submission Time	Status	Action
BN1(BN-0001)	723849028340923032	0x7392749234092840982	USDP-ETH	5	0x7392749234092840982304	2021-10-29 12:12:10	Pending	Detail
BN2(BN-0002)	723849028340923422	0x7392749234092840982	USDP-Tron	5	0x7392749234092840982303	2021-10-29 11:10:10	Permit Processing (TN1)	Detail
BN1(BN-0001)	723849028340923132	0x7392749234092840982	USDC-ETH	5	0x7392749234092840982309	2021-10-28 10:10:34	Transfer Processing(TN1)	Detail
BN3(BN-0003)	723849028340923032	0x7392749234092840982	USDC-Tron	4	0x7392749234092840982301	2021-10-26 11:34:24	Permit Successfully (TN1)	Detail
BN2(BN-0002)	723849028340923432	0x7392749234092840982	USDP-ETH	3	0x7392749234092840982301	2021-10-25 11:34:24	Transfer processed successfully (TN1)	Detail
BN3(BN-0003)	723849028340923032	0x7392749234092840982	USDP-ETH	2	0x7392749234092840982303	2021-10-24 11:34:24	Transfer failed (TN1)	Detail

x items found, display x to x

< 1 2 >

Click the "Detail" button in the list to view the Transfer transaction details:

[< Back](#)

VN Side Transaction Information Detail

Basic Information

BN Name:	232332202110280004	Transaction Key:	232332202110280004
TN Name:	name1	TN Code:	TN20220407000001
Currency Type:	USDC-ETH	Amount:	5USDC
Send Account:	0xadddd23423423423424324	Beneficiary Account:	0xadddd234225687234324324
Beneficiary Name:	name1	Received Amount:	5USDC
Submission Time:	2021-10-25 10:34:12	Status:	TN1 processed successfully
IsKYC:	Yes	BN's wallet for gas fees:	0xadddd234225687234324000

Circulation Information

State machine of a normal transfer transaction



Click the BN paid wallet address, transaction hash, source account address, destination account address and block number in the transfer transaction state machine to jump to the ethereum browser to query the transaction.