

Universal Digital Payments Network

User Manual

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1. UDPN Introduction

Scalable and universal interoperability will enable efficient and smooth movement between the legacy payments infrastructure and the rapidly evolving digital currency infrastructure. The Universal Digital Payment Network (UDPN) addresses this issue by creating a global payment network designed for regulated fiat-backed stablecoins and CBDCs across decentralised and centralised systems.

There is an opportunity to unify the fragmented ecosystems, leveraging Blockchain infrastructure advances and connecting regulated fiat-backed stablecoins and centralised CBDCs. The goal of the UDPN is to create a shared, decentralised network and associated standards to improve cross-border payment processing efficiency. The UDPN enables enterprises from different countries to transact and settle in foreign currencies by merely accessing their Business Nodes installed locally. Furthermore, the UDPN provides a way for commercial banks and regulated businesses to participate in the digital economy.

Just as the SWIFT network (linking more than 11,000 financial institutions across 200 countries and territories) created the original standard for messaging between financial institutions across different settlement systems, the UDPN will serve the same purpose for the emerging generation of CBDCs and stablecoins. By leveraging enterprise DLT blockchain technology for multi-party coordination and using smart contract frameworks to automate settlement and compliance processes in all digital currency systems, the UDPN will lead the way in the next global financial settlement era.

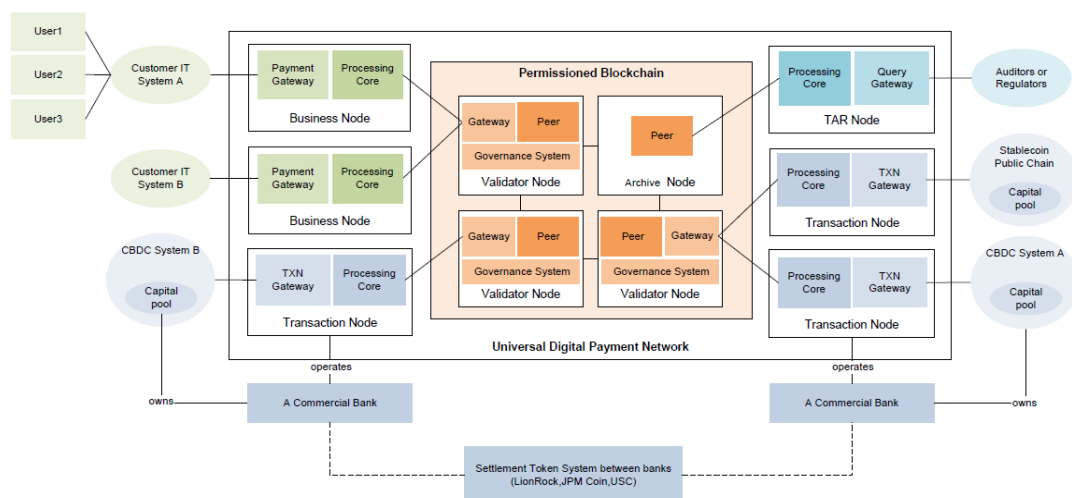
Unlike most other digital currency projects, the UDPN will not issue any central token to be circulated on the network for settlement purposes. Instead, the UDPN will operate more like an inter-currency network, working with multiple stakeholders and becoming the messaging backbone between various CBDC and stablecoin systems.

A key challenge to achieving a common international infrastructure for cross-border payments centres around creating a robust governance model. Specifically, one which allows stakeholders from all countries to participate in the use, development, operation, and maintenance of the network, in a trusted and equitable way. Therefore, the goal of the UDPN is to develop an inclusive framework to address the issues of governance, ownership, and participation in a network leveraging DLT Blockchain technology. To achieve this goal and overcome the challenges in cross-border payments' governance, the UDPN will be managed by an alliance of financial institutions and technology companies from different countries and industry verticals, each having shared ownership of the network.

2. Explanation of Terms

- **Blockchain:** a new application mode of computer technology including distributed data storage, point-to-point transmission, consensus mechanism, and encryption algorithm
- **IT System:** interface through which the end user initiates transfer or swap transactions
- **Business Node (BN):** gateway to the UDPN which is owned and set up by third-party businesses who wish to integrate UDPN services into their business systems
- **Transaction Node (TN):** custom-made software executing validated transactions on the UDPN in their respective digital currency systems
- **Validator Node (VN):** on-chain node connecting all other stakeholders via a secure and encrypted connection to validate any transaction on the UDPN and provide services such as smart contract deployment for Business Nodes and Transaction Nodes
- **Transaction Audit and Reporting (TAR):** on-chain node storing all the block ledger data on the network and facilitating the work of regulators and auditors when monitoring transactions on the network

3. UDPN High-Level Architecture



The primary objective of the UDPN is to provide a messaging infrastructure for global cross-border

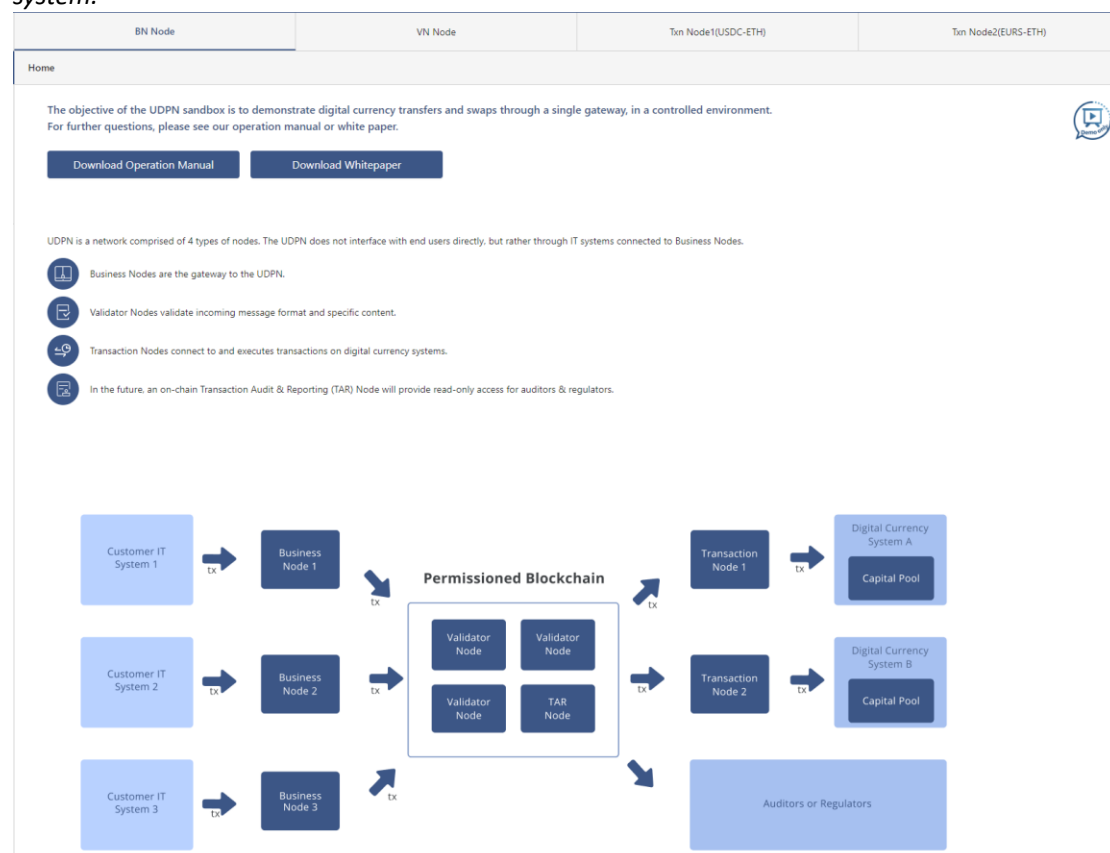
payments of regulated fiat-backed stablecoins and CBDCs. With most businesses being off-chain, the UDPN infrastructure connects businesses' IT systems with stablecoin and CBDCs currency systems, using Hyperledger BESU as the permissioned framework.

The architecture is a permissioned, decentralised network of Validator Nodes (on-chain), which communicate with Business and Transaction Nodes (off-chain). Transaction Nodes operated by regulated institutions securely connect to digital currency systems, while Business Nodes allow any businesses' IT systems to connect to the UDPN. Finally, the on-chain Transaction Audit and Reporting Node facilitates the work of Regulators and Auditors in monitoring transactions of their respective digital currencies.




4. Home

The **Home** page introduces the main objectives of the Sandbox and the UDPN infrastructure. Users can click the "Download Operation Manual" or "Download Whitepaper" buttons to download the relevant documents.

This UI is for demonstration purpose only and will not be implemented in the UDPN production system.



Note: Three icons "Demo", "WEB", and "API" are placed on different pages of the UDPN Sandbox website and are described below:

- 1)  Demo only: this page is for demonstration purpose only and will not be implemented in production
- 2)  Web: this page is available for the user via a Web page in the UDPN production system
- 3)  API: this function will be provided to the UDPN user via an API in production.

5. Account Management

5.1 Overview

The **Account Management** page provides access to various UDPN functions such as creating a DID, linking a digital currency account to a DID, and linking a business account to a UDPN DID.

5.2 DID Generation

The **DID Generation** page describes how IT systems can generate DIDs and their corresponding private keys offline on behalf of end-users. In production, IT systems will be able to generate DIDs offline via a dedicated API.

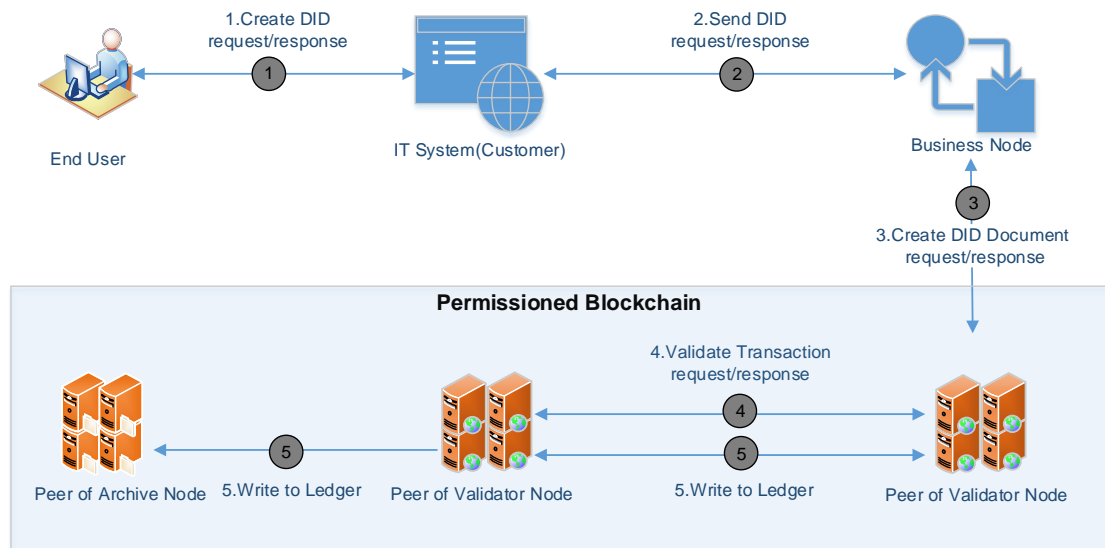
Account Management / DID generation

Since this utility will generate a private key, it is safer to do it locally. Please refer to below instruction:

Step 1: Download jar file and use as below java -jar [Download](#)

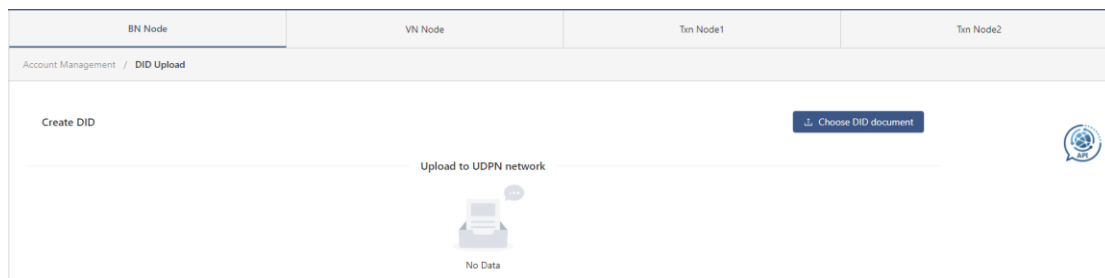
Step 2: Use JDK 8+ to run below command so as to generate DID document offline (you need to input location and dest file name during generation): ' java -jar path-to-downloaded-jar-file '

To generate a DID:



5.3 DID Upload

The **DID Upload** page displays how to upload the DID document generated. In production, Business Node operators can complete this operation via a dedicated API.



5.4 Link a Digital Currency Account to a UDPN DID

A user must bind their DID with a digital currency account before transacting on UDPN. In production, users will link their DID to digital currency accounts via a Web interface or a dedicated API.

The process for linking a digital currency account to a UDPN DID is as follows:

-
- The diagram illustrates the process flow for KYC and account creation in a digital currency system, involving an End User, IT System (Customer), Business Node, Issuer Service of TX Node, and a Permissioned Blockchain network.
- Process Flow:**
- 1.Link DID & Digital Currency Account request/response:** The End User sends a request to the IT System (Customer).
 - 2.Link DID & Digital Currency Account request/response:** The IT System (Customer) sends a request to the Business Node.
 - 3.Verify account request/response (If KYC needed):** The Business Node sends a request to the Issuer Service of TX Node.
 - 4.Issue credential (KYC signature if needed):** The Issuer Service of TX Node sends a response to the Business Node.
 - 5.Link DID & Digital Currency Account request/response:** The Business Node sends a request to the Peer of Validator Node in the Permissioned Blockchain.
 - 6.Validate Transaction request/response:** The Peer of Validator Node sends a response to the Peer of Validator Node.
 - 7.Write to Ledger:** The Peer of Validator Node sends a request to the Peer of Archive Node.
- Components:**
- End User:** Represented by an icon of a person at a computer.
 - IT System (Customer):** Represented by an icon of a server and a globe.
 - Business Node:** Represented by an icon of a person and a server.
 - Issuer Service of TX Node:** Represented by an icon of a person and a server.
 - Permissioned Blockchain:** A network of nodes including:
 - Peer of Archive Node:** Represented by an icon of three stacked blocks.
 - Peer of Validator Node:** Represented by an icon of three stacked blocks with a green checkmark.
 - Peer of Validator Node:** Represented by an icon of three stacked blocks with a green checkmark.

5. Include a simple description
 6. Select whether the digital currency account should be used as your default account. You can only select one default account per currency and digital currency system
 7. Click "Bind" to complete the DID and account linking operation
- To make a DID Query:
 1. Enter a DID. Make sure to enter the DID correctly
 2. Select the currency type
 3. Click on the "Query" button to retrieve all relevant linking information regarding the DID and the chosen currency

Note the "Currency Type" dropdown menu is set to "All" by default to show all digital currencies linked to the desired DID.

BN Node VN Node Tm Node1 Tm Node2

Account Management / Link Digital Currency Account to UDPN DID

Prior to transacting on UDPN, a user's DID must be linked with their digital currency wallet.

Query Accounts



DID: Currency Type:

To search for an account binding, please enter DID and Currency Type, then click Query.

Binding List



Currency type	Digital Currency Account Address	Binding Time	Action
No Data			

- To "Unbind" a digital currency account from a DID:
 1. Enter the desired DID
 2. Click the "Query" button to review all accounts linked to the desired DID
 3. Select the linked account you want to unbind and click on the "Unbind" button
 4. Confirm your decision to unbind the DID and the digital currency account
- Upon confirmation, the DID and digital currency account will no longer be linked. Therefore, you will no longer be able to use this account on the UDPN.

BN Node	VN Node	Txn Node1	Txn Node2
Account Management / Link Digital Currency Account to UDPN DID			
Prior to transacting on UDPN, a user's DID must be linked with their digital currency wallet.			
Query Accounts		 	
DID <input type="text" value="did:udpn:38vtqfpacG6VefSEwoKE21hsfeV8"/>		Currency Type <div> <input type="text" value="All"/> <input type="text" value="All"/> </div>	
		<input type="button" value="Query"/> <input type="button" value="Reset"/>	
To search for an account binding, please enter DID and Currency Type, then click Query.			
Binding List		<input type="button" value="Create a Binding"/>	
Currency type ▾	Digital Currency Account Address	Binding Time ▾	Action
USDC-ETH	0x4365d3B5FAC9d758492C6F5269b9319271Ef49AB	2022-07-14 16:24:51	<input type="button" value="Unbind"/> <input type="button" value="Set as Default Account"/>
<div> <input type="button" value="1"/> <input type="button" value="1"/> <input type="button" value="1"/> </div>			

- Set an existing account as "Default" (assuming a digital currency account is already linked to the desired DID):
 - Enter the desired DID in the search box
 - Click on the "Query" button
 - Select the account you want to set as your default account by clicking the "Set as Default Account" button

If there is an existing default account for a given currency and platform, the existing account will be overwritten.

BN Node	VN Node	Txn Node1	Txn Node2
Account Management / Link Digital Currency Account to UDPN DID			
Prior to transacting on UDPN, a user's DID must be linked with their digital currency wallet.			
Query Accounts		 	
DID <input type="text" value="did:udpn:38vtqfpacG6VefSEwoKE21hsfeV8"/>		Currency Type <div> <input type="text" value="All"/> <input type="text" value="All"/> </div>	
		<input type="button" value="Query"/> <input type="button" value="Reset"/>	
To search for an account binding, please enter DID and Currency Type, then click Query.			
Binding List		<input type="button" value="Create a Binding"/>	
Currency type ▾	Digital Currency Account Address	Binding Time ▾	Action
USDC-ETH	0x4365d3B5FAC9d758492C6F5269b9319271Ef49AB	2022-07-14 16:24:51	<input type="button" value="Unbind"/> <input type="button" value="Set as Default Account"/>
<div> <input type="button" value="1"/> <input type="button" value="1"/> <input type="button" value="1"/> </div>			

5.5 Link a UDPN DID to a Business Account

Business Accounts are the equivalent of external identifiers. For example, a bank account number could be used as a "Business Account" on UDPN and linked with DIDs. The UI will display DIDs and their linked business accounts in a table (shown below). In production, users will be able to bind their Business Accounts with their DID via a dedicated API.

- To link a DID with a Business Account:
 1. Click on the "Link UDPN DID to Business Account" menu
 2. Click on the "Add" button to open an "Account Binding" pop-up window
 3. Enter the desired Business Account name
 4. Enter the desired DID
 5. Click on the Confirm button to link the desired DID to the desired Business Account. A user can bind any business account to their DID

Account binding

To link your business account to an existing digital currency account, enter your business account and DID.

* Business Account

* DID

Cancel

Confirm

- To make a Business Account & DID query:
 1. Enter the desired Business Account in the textbox displayed below
 2. Enter the desired DID in the textbox displayed below
 3. Click on the "Query" button

BN Node

VN Node

Txn Node1

Txn Node2

Account Management / Link UDPN DID to Business Account

Here, you can link your business account to an existing digital currency account.

Query Accounts

Business Account

DID

Query

Reset

Add

Business account	DID (linked to business account)	Currency type	Currency account (linked to DID)	Action
zhangsan	did:udp:38vtgfpacG6VefSEwoKE21hsfeV8	USDC-ETH	0w4365d385FAc9d758492C6F5269b9319271E49A8	<div>Edit</div> <div>Unbind</div>
		bbb-AAA	12312	

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- To edit a binding, proceed as follows:
 1. Select the desired DID and business account you want to edit from the table on the "Link UDPN DID to Business Account" page
 2. Click "Edit"
 3. Make any desired change and confirm

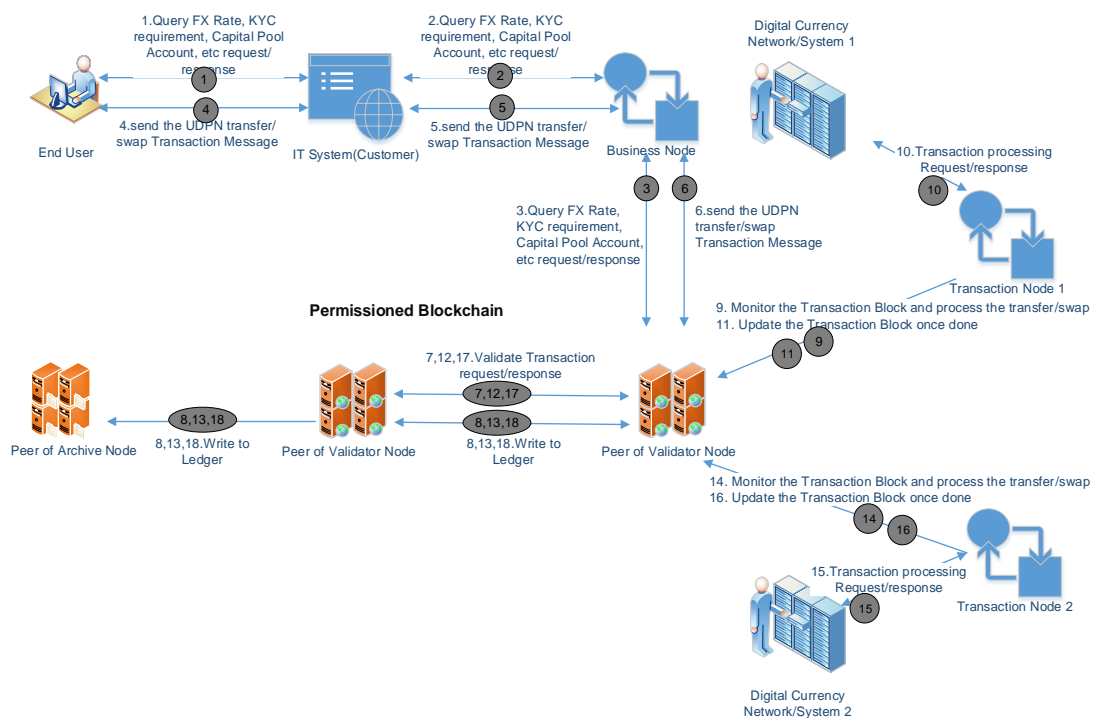
- To "Unbind" a Business Account from a DID, proceed as follows:
 1. Select the linked DID and Business Account you would like to unbind from the list on the "Link UDPN DID to Business Account" page
 2. Upon clicking "Unbind," the UI will no longer display unbound data in the table

6.Transaction Management

6.1 Overview

The **Transaction Management** Page facilitates the execution Transfer/Swap transactions and queries of relevant transaction information.


Please refer to the diagram below to familiarize yourself with transfers and swaps on the UDPN:




6.2 Transfer

The Transfer page simulates how IT Systems complete transfers on behalf of end users. It also illustrates a complex linking scenario. In this scenario, a DID is linked to both a Business Account (e.g., a bank account), and a digital currency account. Entering the Business Account allows the system to auto-fill most of the information required.

In production, this function will be accessible via a dedicated API.

BN Node	VN Node	Txn Node1	Txn Node2
Transaction Management / Transfer			
<p>Use this screen to transfer a digital currency either internal to your Business Node or externally. Prior to transacting on UDPN, users must have bound their DID to an applicable digital currency wallet.</p> 			
Sender Details		Beneficiary Details	
Business Account:	<input type="text" value="Business Account"/>	* Beneficiary Type:	<input type="text" value="Internal Bank Beneficiary"/>
* Sender DID:	<input type="text" value="Sender DID"/>	Beneficiary Name:	<input type="text" value="Beneficiary Name"/>
* Source Currency Type:	<input type="text"/>	* Business Account:	<input type="text" value="Business Account"/>
* Send Account:	<input type="text" value="Send Account"/>	* Beneficiary Account:	<input type="text" value="Beneficiary Account"/>
* Send Amount:	<input type="text" value="Send Amount"/>		
		<input type="button" value="Next"/> <input type="button" value="Reset"/>	

- Complete the Sender Details:
 1. Input the Business Account and Sender DID
 2. Select the currency type and input the Sender Account and the sending amount
 3. Complete the Beneficiary Details. Select Beneficiary Type, specifying whether the beneficiary is an Internal Client or an External Beneficiary. If the Beneficiary Type is an Internal Bank Beneficiary, enter the Beneficiary Name and associated Business Account
 4. Enter the associated Beneficiary Account
 5. Click the "Next" button to go to the next page

Txn Management / Transfer / Info							
Available Transaction Nodes							
							
TN Name	TN Code	Currency Type	Amount	Service Fee	Total Amount	IsKYC	Action
TNUSDC	TN0000023	USDC-ETH	12	1.051	13.051	Yes	simulate signing(end-user) Detail
							<input type="button" value="1"/>

- How to simulate a signature from an end user's perspective: The sender must sign a transfer transaction for the transaction to be executed. After clicking the "Simulate Signing" button, the Sandbox will simulate a signature request.

Simulated Signature

```

{
  "message":
  "TN Code": "TN0000023",
  "Amount": "12",
  "serviceFee": 1.051,
  "sourceAccountAddress": "0x4365d3B5FAc9d758492C6F5269b9319271Ef49AB",
  "sourceCurrencyType": "USDC/ETH",
  "TotalAmount": 13.051,
  "targetAccountAddress": "0x1115C664C7496C28EE5F31802FF00D5C392E46A3",
  "userDid": "did:udp:n38vtqfpacG6VefSEwoKE21hsfeV8",
  "IsKYC": "No"
}

```

.....

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.

Sign and Submit

Cancel

The end user must enter their private key (starting with 0x) in the above interface and then click the "Sign and Submit" button to submit the transaction for execution.

After the transfer transaction is successful, you will get a unique transaction key that you can use to query for the transaction. Save this key in a secure location to query the transaction information.

Home
 Contact us
 lisan
 Exit

BN Node	VN Node	Txn Node1	Txn Node2
TN Name			
TN0000023	TN0000023	USDC-ETH	12
USDC-TN	TN0000004	USDC-ETH	12

✓

success

The transaction key is:
 VN0000015_BN0000007_5319ea6fee6e49fdb8c91920bdaaa20c1658286377935

OK

Total Amount	IsKYC	Action
12.002	Yes	simulate signing(end-user) Detail
12.002	No	simulate signing(end-user) Detail

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- Detail:** displays the transfer details, such as Sender and Beneficiary Details.

BN Node	VN Node	Txn Node1	Txn Node2
Txn Management / Transfer / Info			
Sender Details Business Account: zhangsan Sender DID: didudpn:38vrtqpacG6VefSEwoKE21hsfeV8 Currency type: USDC-ETH Sender Account: 0x4365d3B5Fac9d758492C6F5269b9319271E49AB Amount: 20 USDC Other information TN Name: TN06281 Gas: 0 Total Amount: 20.002 USDC		Beneficiary Details Beneficiary Type: Internal Bank Beneficiary Beneficiary Name: Business Account: 233 Beneficiary Account: 0x1115C664C7496C28EE5F31802F00D5C392E46A3 Amount received: 20 USDC TN Code: TN0000002 Service fee: 0.002 USDC IsKYC: No	

[Back](#)

6.3 Swap

The **Swap** page shows how IT systems can complete digital currency swaps on behalf of end-users. In production, this function will be accessible via a dedicated API. In the scenario below, the bank account used as a Business Account is linked to a UDPN DID. This UDPN DID itself links to a digital currency account. Entering the Business Account allows the system to auto-fill most of the information required. The connected digital currency account can also be displayed automatically upon selecting a currency type in the drop-down menu.

BN Node	VN Node	Txn Node1	Txn Node2
Transaction Management / Transfer			
<p>Use this screen to transfer a digital currency either internal to your Business Node or externally. Prior to transacting on UDPN, users must have bound their DID to an applicable digital currency wallet.</p> 			
Sender Details Business Account: <input type="text" value="Business Account"/> * Sender DID: <input type="text" value="Sender DID"/> * Source Currency Type: <input type="text" value=""/> * Send Account: <input type="text" value="Send Account"/> * Send Amount: <input type="text" value="Send Amount"/>		Beneficiary Details * Beneficiary Type: <input type="text" value="Internal Bank Beneficiary"/> Beneficiary Name: <input type="text" value="Beneficiary Name"/> * Business Account: <input type="text" value="Business Account"/> * Beneficiary Account: <input type="text" value="Beneficiary Account"/>	
		<input type="button" value="Next"/> <input type="button" value="Reset"/>	

- To complete a swap on the UDPN:
 - Complete the Sender Details by entering the Business Account and Sender DID.
 - Select a Source Currency Type from the dropdown menu
 - Enter the Sender Account and Amount to send
 - Select the Beneficiary Type from the relevant dropdown menu (selection options include Internal Bank Beneficiary and External Beneficiary) and a Target Currency Type from the appropriate dropdown menus

5. Input the Beneficiary Account
6. Click on the "Next" button to jump to the next page

Please note that the Beneficiary Name and Business Account fields will only be available when the Beneficiary is an Internal Bank Beneficiary.

BN Node


VN Node

Txn Node1

Txn Node2

Txn Management / Swap / Info

Available Transaction Nodes



Source TN Name	Source Currency	Amount	Rate	Service Fee	Total Amount	Target Tn Name	Target Currency	IsKYC	Action
TNUSDC	USDC-ETH	11	1.086	2.1913	13.1913	TNEURS2	EURS-ETH	Yes	simulate signing(end-user) Detail

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- How to simulate a signature from an end user's perspective: The sender needs to sign a swap transaction for the transaction to be executed.
 1. Click on the "Simulate Signing" button
 2. Enter your private key (starting with 0x) in the above interface and then click the "Sign and Submit" button to submit the transaction for execution

Simulated Signature

```

{
  "message":
    "Source TN Code": "TN0000023",
    "Amount": "12",
    "serviceFee": 2.191,
    "Rate": 1.086,
    "sourceAccountAddress": "0x4365d385FAC9d758492C6F5269b9319271E49AB",
    "sourceCurrencyType": "USDC/ETH",
    "TotalAmount": 14.191,
    "target TN Code": TN0000026,
    "targetAccountAddress": "0x1115C664C7496C28EE5F31802FF00D5C392E46A3",
    "targetCurrencyType": "EURS/ETH",
    "userDid": "did:udpni:38vtqfpacG6VefSEwoKE21hsfeV8"
    "IsKYC": "Yes"
}

```

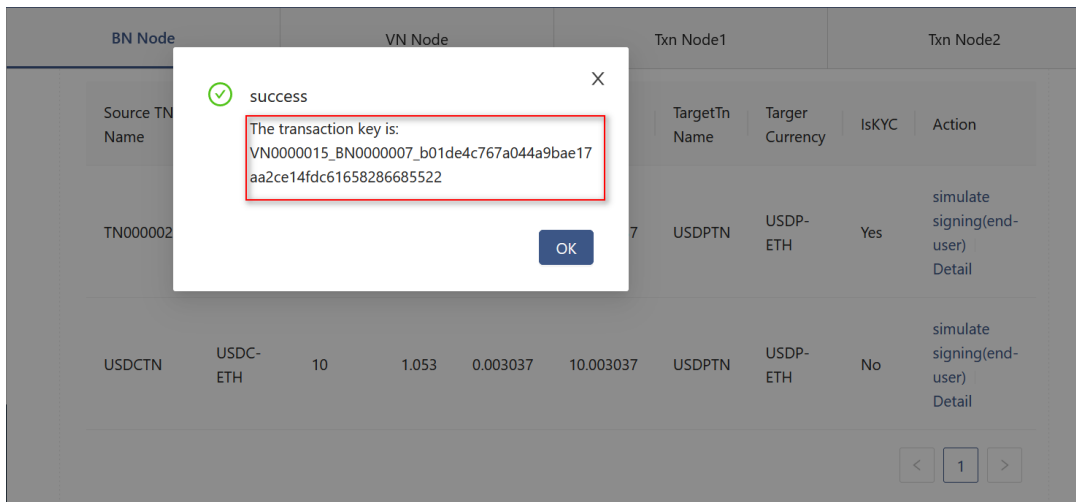
.....

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.

Sign and Submit

Cancel

After the swap transaction is successful, a unique transaction key will be generated. Save this key in a secure location to query the transaction information.



- **Detail:** used to display the details of a transfer, including Sender and Beneficiary Details

BN Node	VN Node	Txn Node1	Txn Node2
Sender Details		Beneficiary Details	
Business Account:	zhangsan	Beneficiary Type:	Internal Bank Beneficiary
Sender DID:	did:udp:n38vtpqfpacG6Vet5EwoKE21hsfeV8	Target currency type:	USDP-ETH
Source Currency type:	USDC-ETH	Beneficiary's name:	
Sender Account:	0x4365d3B5FAc9d758492C6F5269b9319271E449AB	Business Account:	12
Amount:	1 USDC	Beneficiary Account:	0x1115C664C7496C28EE5F31802FF00D5C392E46A3
		Amount received:	1.022 USDP
Other information			
TN Name:	TN06281	TN Code:	TN0000002
Target TN Name:	TN06282	Target TN Code:	TN0000004
Rate:	1.022	Gas:	0
Service fee:	0.003078 USDC	Total Amount:	1.003078 USDC
IsKYC:	No		
Back			

6.4 Transactions Search

The **Transactions Search** page demonstrates how users can query transaction information via their IT system. In production, this function will be accessible via a dedicated API.

Transaction Management / Transactions Search

Query

DID: Txn Key: Txn Type: Source Currency:

Source PlatformType: Target Currency: Target PlatformType: Transaction Submit Date: →

Status:

Query **Clear**

List

DID	Txn Key	Txn Type	Source Currency	Amount	Target Currency	Submission Time	Status	Action
didudpn4Gyvwavcbw3hCEig8hiqc5Yie5Nb	VN1111_B...	Transfer	USDC-ETH	666.666	USDC-ETH	2022-08-26 16:38:35 PM GMT+8	TN1 processing	Detail
didudpn4Gyvwavcbw3hCEig8hiqc5Yie5Nb	VN1111_B...	Swap	USDC-ETH	3.333	EURS-ETH	2022-08-25 15:14:08 PM GMT+8	TN1 processing	Detail
didudpn4Gyvwavcbw3hCEig8hiqc5Yie5Nb	VN1111_B...	Transfer	USDC-ETH	0.01	USDC-ETH	2022-08-25 15:10:37 PM GMT+8	TN1 processing	Detail

- Query transaction information:
 - Enter the desired DID and Transaction keys
 - Select the Transaction Type, Source Currency, Target Currency, Transaction Submit Date, and Status
 - Click on the "Query" button. The search results will be displayed in the Transaction table below the Transaction Query Section

Transaction Management / Transactions Search

Query

DID: Txn Key: Txn Type: Source Currency:

Source PlatformType: Target Currency: Target PlatformType: Transaction Submit Date: →

Status:

Query **Clear**

List

DID	Txn Key	Txn Type	Source Currency	Amount	Target Currency	Submission Time	Status	Action
didudpn4Gyvwavcbw3hCEig8hiqc5Yie5Nb	VN1111_B...	Transfer	USDC-ETH	666.666	USDC-ETH	2022-08-26 16:38:35 PM GMT+8	TN1 processing	Detail
didudpn4Gyvwavcbw3hCEig8hiqc5Yie5Nb	VN1111_B...	Swap	USDC-ETH	3.333	EURS-ETH	2022-08-25 15:14:08 PM GMT+8	TN1 processing	Detail
didudpn4Gyvwavcbw3hCEig8hiqc5Yie5Nb	VN1111_B...	Transfer	USDC-ETH	0.01	USDC-ETH	2022-08-25 15:10:37 PM GMT+8	TN1 processing	Detail

- View details: Transaction details include primary sender/beneficiary information and transfer/settlement information
 - Choose one of the transactions in the Transaction List
 - Click on the "Detail" button to view the transaction details.

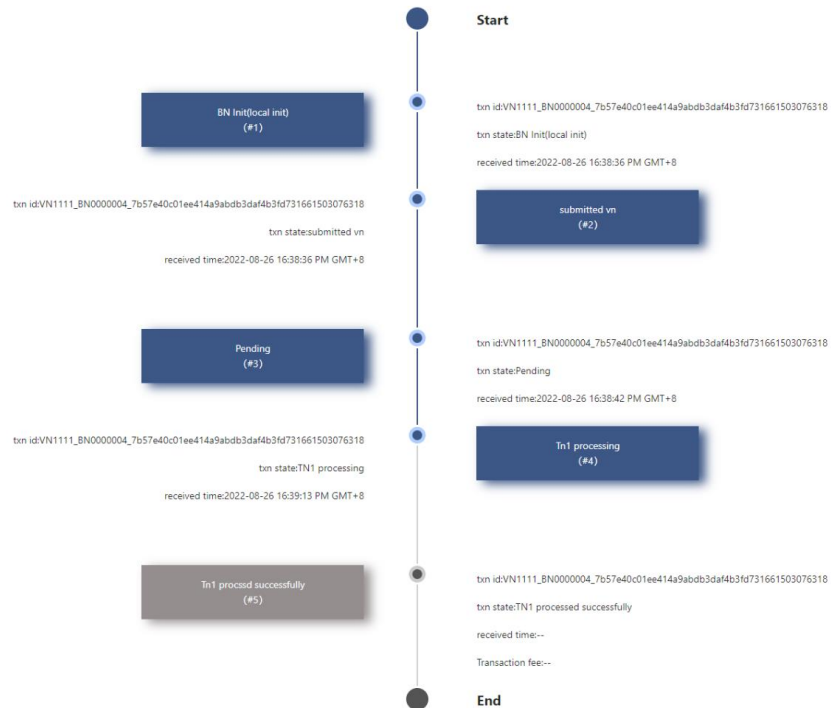


Basic Information

DID	didudpm4GyrwawcBw3hCEigBhiq6Yie5Nb		
Transaction Type	Transfer	Amount	666.666 USDC
Source Currency	USDC-ETH	Target Currency	USDC-ETH
Source Account Address	0x349c666566fcd9e82f18Cc68823b919641254d4e		
Target Account Address	0x1115C664C7496C28EE5F31802FF00D5C392E46A3		
TN Name	TNUSDC	TN Code	TN0000023
Service Fee	1.051 USDC	Rate	--
Total Amount	666.667.051 USDC	Received Amount	666.666 USDC
Submission Time	2022-08-26 16:38:35 PM GMT+8		
Status	TN1 processing		
Transaction Key	VN1111_BN0000004_7b57e40c01ee414a9abdb3daf4b3fd731661503076318		

Circulation Information

State machine of a normal transfer transaction



Txn Settlement

6.5 Search by Transaction Key

This page shows how IT System users can query a transaction's information using a Transaction Key. In production, this function will be accessible via a dedicated API.

Transaction Management / Search by Transaction Key

Use this page to find details about a particular transaction using its transaction key.

Transaction Key:

- **Query:**

1. Enter the desired Transaction Key
2. Click on the "Query" button to go to the "Transaction Details" page, which displays the primary sender and beneficiary information as well as the transfer and settlement information



Basic Information

DID	did:udp:m4GynwarcBw3hCEigBhiqcGYie5Nb		
Transaction Type	Transfer	Amount	666.666 USDC
Source Currency	USDC-ETH	Target Currency	USDC-ETH
Source Account Address	0x349c666566fcd9e82f18Cc68823b919641254d4e	Target Account Address	0x1115C664C7496C28E5F31802FF00D5C392E46A3
TN Name	TNUSDC	TN Code	TN0000023
Service Fee	1.051 USDC	Rate	--
Total Amount	666.667.051 USDC	Received Amount	666.666 USDC
Submission Time	2022-08-26 16:38:35 PM GMT+8	Status	TN1 processing
Transaction Key	VN1111_BN00000004_7b57e40c01ee414a9abdb3daf4b3fd731661503076318		

Circulation Information

State machine of a normal transfer transaction



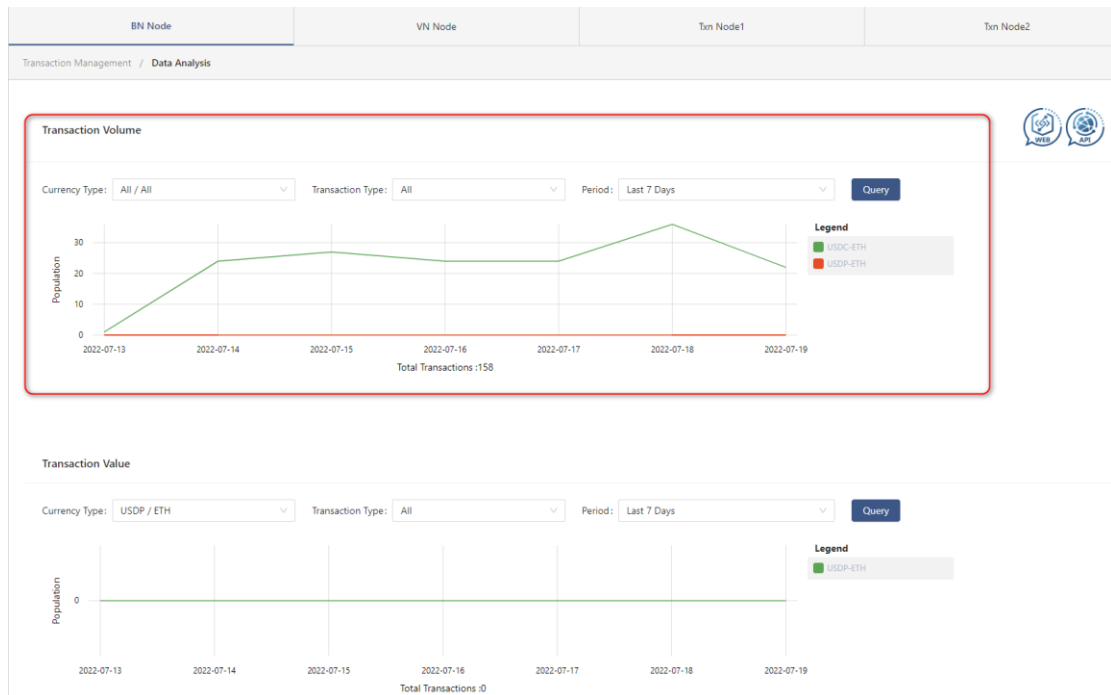
Txn Settlement

6.6 Data Analysis

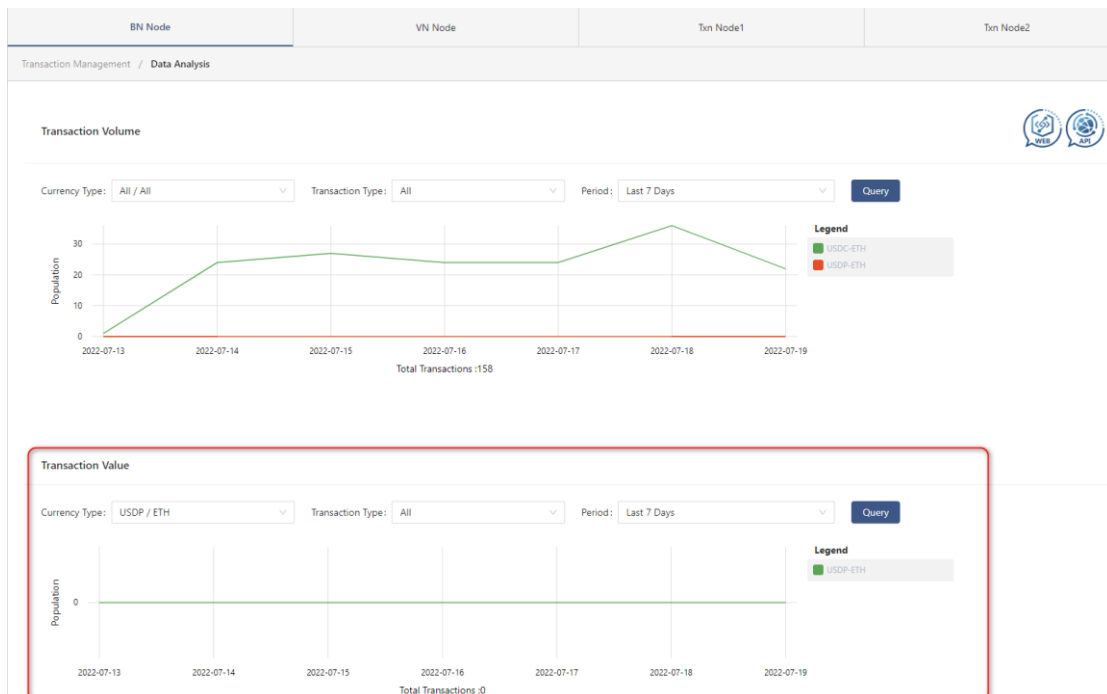
The Data Analysis Page displays the number and volume of transactions processed in the past 7 or 30 days based on the different currencies and transaction types. This function will be accessible via a web interface or a dedicated API in production.

- Transaction Volume: After selecting the currency type, transaction type and period of

interest, click the "Query" button to see the total number of transactions in the past 7 or 30 days.



- **Transaction Value:** After selecting the currency type, transaction type and statistical period, users can click "Query" to query the total transaction value of a particular currency in the past 7 or 30 days.



7. Network Access Configuration




7.1 Overview

The **Network Access Configuration** page allows the BN operator to access the UDPN network and digital currency systems supported by the UDPN network. A BN operator must provide information such as its enterprise name, country, node name, connected VN, locally generated DID (see section 5.2), contact email and business license to access the UDPN Network. The **Digital Currency Access** page shows the digital currencies available to IT systems via the BN Node gateway and the future currencies that will be supported on the UDPN.




In the current sandbox, the Network Access Configuration and Digital Currency Access pages are for demonstration purpose only and are not functional. In production, a BN administrator will be able to complete the BN Node network access and configuration via a secure website or via APIs supported by VNs.

7.2 BN Onboarding and Configuration

To apply for UDPN access as a BN operator, a user can click on the "BN Onboarding and Configuration" tab in the pull-down menu for "Network Access Configuration:"







BN Node	VN Node	Txn Node1	Txn Node2
Network Access Configuration / BN Onboarding and Configuration			
<p>To onboard a Business Node, input the following information. This process can also be completed via API (link).</p> <div style="text-align: right;">    </div> <div> <div> <div>Enterprise Name</div> <input type="text"/> </div> <div> <div>Country</div> <div>please select</div> </div> </div> <div> <div>Node Name</div> <input type="text"/> </div> <div> <div>Select Validator Node</div> <div> <input type="text"/> <div>Select</div> </div> </div> <div> <div>Brief Introduction</div> <input type="text"/> </div> <div> <div>Description (Optional)</div> <input type="text"/> </div> <div> <div>Upload the Node's DID document</div> <div> <div>Browse</div> <div></div> </div> </div> <div> <div>Contact Email Address</div> <input type="text"/> <div> <div>Verification Code</div> <div>Send Verification Code</div> </div> </div> <div> <div>Business License</div> <div> <div> <div>+</div> <div>Upload</div> </div> <div> <p>"It is recommended to provide 160*160 (png/jpg/gif/bmp/jpeg) pictures, which must be the company or product logo and not deformed"</p> </div> </div> </div> <div> <div>Save</div> <div>Submit</div> </div>			

- Enter the relevant BN information (including enterprise name, country, node name, connected validator node, DID, contact email, business license) and click "Submit."
- After applying for Business Node access to the UDPN network, the Validator Node operators will vote on granting UDPN access to the BN applicant. Upon approval, the Business Node information will be displayed as shown below:

BN Node	VN Node	Txn Node1	Txn Node2
Network Access Configuration / BN Onboarding and Configuration			
<div>    </div>			
type	Corporate	Enterprise Name	Reddatetech
Country	China	Node Name	Node1
Connected VN node	VN-test-node1	Region of connected VN node	Beijing
Creation time	2022-07-05 15:00:41 PM GMT+8	Update time	2022-07-05 15:00:41 PM GMT+8
Status	Pending approval		
Brief introduction	This is a node.		
Description	This is a node. This is a node.		
Node DID Document	<pre>{ "authentication": { "publicKey": "2525960016289206400249024146708991648864106198809212451355987516090805025390473366595225089488546291191499229438073542934415481631996667588696900643087175", "type": "Secp256k1" }, "created": "2021-06-16 16:49:07", "did": "did:udp:ncsEqtdfNowwG1RWqWzYtVnNduVt", "proof": { "creator": "did:udp:ncsEqtdfNowwG1RWqWzYtVnNduVt", "signatureValue": "1Td7HA27dVpwwBntRw8XURqK3CKSATDGAmrSyOw9vSpXy5JaKPO9/TPa7fcQOm281CCT3QGirebmOg8+1Bs=", "type": "Secp256k1" }, "recovery": { "publicKey": "8770612014228708482959823744674965821547249469321905390679101898332601095020641588985623622725698408233410027597370233300561460603204227545996152262546573", "type": "Secp256k1" }, "updated": "2021-06-16 16:49:07", "version": "1" }</pre>		
	Download		

7.3 Access Digital Currencies

The BN Operator can click "Access Digital Currencies" in the pull-down menu for "Network Access Configuration" to display the "Access Digital Currencies" sub-page:

BN Node	VN Node	Txn Node1	Txn Node2
Network Access Configuration / Access Digital Currencies			
Using UDPN, IT system users can access the following digital currencies through a Business Node gateway. Alliance Members can vote to add more in the future.			
			
Currency type	Status	Action	
USDC-ETH 	Enabled	Permission management	
USDP-ETH 	Enabled	Permission management	
EURS-ETH 	Available	Enable	
XSGD-ETH 	Coming Soon		
CBDC-XXX 	Under Research		

- The BN Operator can click "Access Digital Currencies" in the pull-down menu for "Network Access Configuration" to display the following page:

Permission management

Here you can configure IT system user permissions for operations using this currency.

Account Creation: ☒ Yes ☐ No

Link Digital Currency account to UDPN DID: ☒ Yes ☐ No

Transfer: ☒ Yes ☐ No

Swap: ☒ Yes ☐ No

Cancel Confirm

- **Enable:** If the UDPN supports a currency, but the IT system users are not allowed to use it, click "Enable" here will make it available to them.

BN Node	VN Node	Tm Node1	Tm Node2
Network Access Configuration / Access Digital Currencies			
Using UDPN, IT system users can access the following digital currencies through a Business Node gateway. Alliance Members can vote to add more in the future.			
Currency type	Status	Action	
USDC-ETH	Enabled	Permission management	
USDP-ETH	Enabled	Permission management	
EURS-ETH	Available	Enable	
XSGD-ETH	Coming Soon		
CBDC-XXX	Under Construction		

- Users can click "Help" to direct to the official website of the currency that is or will be supported by the UDPN network.

BN Node	VN Node	Tm Node1	Tm Node2
Network Access Configuration / Access Digital Currencies			
Using UDPN, IT system users can access the following digital currencies through a Business Node gateway. Alliance Members can vote to add more in the future.			
Currency type	Status	Action	
USDC-ETH	Enabled	Permission management	
USDP-ETH	Enabled	Permission management	
EURS-ETH	Available	Enable	
XSGD-ETH	Coming Soon		
CBDC-XXX	Under Construction		

8. Contract Management

The sandbox provides sample smart contracts that users can download and review. Users can simulate the deployment of a smart contract in UDPN, review the call permissions, and access mock deployment information.

Smart contract management is for demonstration purposes only and has not been made operational yet. The smart contract management functionality will be available later in production.

- **How to download a smart contract:** Choose one of the sample smart contracts from the list and click on the "Download" button to save the file locally.

BN Node


VN Node

Txn Node1

Txn Node2

Contract Deployment / Contract List

You can download and deploy the contracts here. Please be aware that this function will not be implemented in early stage of UDPN and we'd like to demonstrate the capability of UDPN in the future.



Contract name	Version No.	Description	Deployment time	Status	Action
Example contract	0.8.0	The basic functions of erc-20 token are simply realized.	--	Not deployed	<div>Download</div> <div>Deploy</div> <div>Detail</div>
FiatTokenProxy	v0.4.24+commit.e67f0147	Smart contract deployed by USDC on ETH.	--	Deploying	<div>Download</div> <div>Detail</div>
AdminUpgradeabilityProxy	v0.4.24+commit.e67f0147	Smart contract deployed by USDP on ETH.	2021-12-07 11:34:12	Deployment successful	<div>Download</div> <div>Detail</div> <div>Manage</div>
FiatTokenProxy	v0.4.24+commit.e67f0147	Smart contract deployed by USDC on ETH.	2021-11-22 10:18:14	Deployment failed	<div>Download</div> <div>Detail</div>

- **How to deploy a smart contract:** Choose one of the sample smart contracts from the list and click the "Deploy" button to simulate a smart contract deployment.

BN Node


VN Node

Txn Node1

Txn Node2

Contract Deployment / Contract List

You can download and deploy the contracts here. Please be aware that this function will not be implemented in early stage of UDPN and we'd like to demonstrate the capability of UDPN in the future.



Contract name	Version No.	Description	Deployment time	Status	Action
Example contract	0.8.0	The basic functions of erc-20 token are simply realized.	--	Not deployed	Download Deploy Detail
FiatTokenProxy	v0.4.24+commit.e67f0147	Smart contract deployed by USDC on ETH.	--	Deploying	Download Detail
AdminUpgradeabilityProxy	v0.4.24+commit.e67f0147	Smart contract deployed by USDP on ETH.	2021-12-07 11:34:12	Deployment successful	Download Detail Manage
FiatTokenProxy	v0.4.24+commit.e67f0147	Smart contract deployed by USDC on ETH.	2021-11-22 10:18:14	Deployment failed	Download Detail

The private key for the Business Node is required to deploy a smart contract. You will be prompted to enter your username and password in the popup window first to access the Business Node private key.

Deploy

Please enter an user name and password to access the BN private key.

User name

Password

Cancel Confirm

After entering the correct username and password, the system will prompt you to confirm that you want to use the Business Node's private key to deploy the smart contract. After clicking on the "OK" button, the smart contract deployment process starts.

? Are you sure you want to use this BN's private key to deploy the contract?

Cancel OK

- **Manage:** the "manage" link is used to manage contract permissions.
-

? Notice: This function is displayed for demo purposes only.It is not functional yet.

Cancel OK

- **Detail:** The page below is used to check the deployment details following deployment.

BN Node	VN Node	Txn Node1	Txn Node2
Contract Deployment / My deployment contract / Info			
<div>Basic Information</div> <div> <div>Contract name</div> <div>Example contract</div> <div>Version No.</div> <div>0.8.0</div> </div> <div> <div>Description</div> <div>The basic functions of erc-20 token are simply realized.</div> </div> <div> <div>Deployment time</div> <div>--</div> <div>Status</div> <div>Not deployed</div> </div>			
<div>Circulation Information</div> <div> <div>UDPN Framework</div> <div>Besu</div> <div>Gateway address</div> <div>http://udpn.xogate.com:18602</div> </div> <div> <div>Contract address</div> <div>0x97cD06e234323232423423423dc66</div> </div>			

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9. Validator Node

9.1 Overview

The Validator Nodes are at the heart of the UDPN, validating incoming message format and specific aspects of the content. VNs store the complete set of transaction data on the UDPN.

The Validator Nodes are connected to the Business and Transaction Nodes through secure APIs. The VN module in the UDPN Sandbox shows the transactions submitted by all business nodes.

9.2 Transaction Query

You can query transactions by selecting the following information: BN Name, Transaction Type, Source Currency, Target Currency, Transaction Submission Date, Status, DID, Transaction Key. Then, click the "Query" button.

Txns Query

BN Name

BN Name

DID

DID

Txn Key

Txn Key

Txn Type

All

Source Currency

All

Source PlatformType

All

Target Currency

All

Target PlatformType

All

Submission Date

Start date → End date

Status

All

Query

Clear

Txns List

BN Name	DID	Txn Key	Txn Type	Source Currency	Amount	Target Currency	Transaction Submit Time	Status	Action
bn00001	did:udp:38vtofpaG6Vef5EweKE21hsfeVB	VN000001...	Swap	USDC-ETH	10	USDP-ETH	2022-07-20 11:11:40	Pending	Detail
bn00001	did:udp:38vtofpaG6Vef5EweKE21hsfeVB	VN000001...	Transfer	USDC-ETH	12	USDC-ETH	2022-07-20 11:06:34	Pending	Detail
bn00001	did:udp:5Gc2h2AEuLkUHjCfTqYBGygeKZ	VN000001...	Transfer	USDC-ETH	0.01	USDC-ETH	2022-07-20 11:00:10	TN1 processed successfully	Detail

9.3 Transaction Details Display

This section displays transaction details, including DID, transfer, and settlement information.

← Back

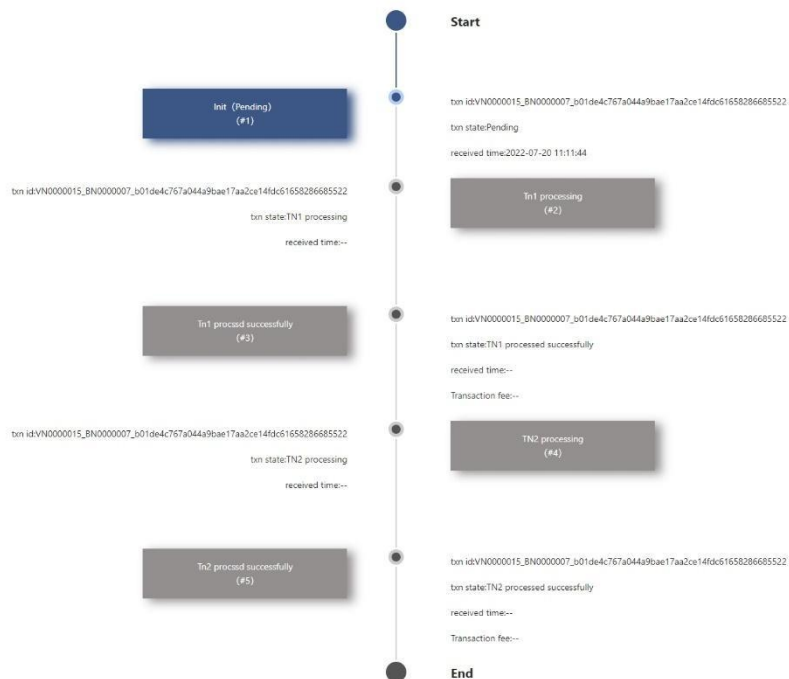
Basic Information



BN Name:	bn00001	DID:	did:udp:38:ntfpacGVer5EwoKE21hsfeV8
Transaction Type:	Swap	Amount:	10 USDC
Transaction Key:	VN0000015_BN0000007_b01de4c767a044a9bae17aa2ce14fd651658286685522		
Source Currency:	USDC-ETH	Target Currency:	USDP-ETH
Source Account Address:	0x4365d385FAC9d758492C6F5269b9319271E49AB	Target Account Address:	0x1115C664C7496C28EEF31802FF00D5C392E46A3
Service Fee:	0.003037 USDC	Rate:	1.053
Total Amount:	10.003037 USDC	Received Amount:	10.53 USDP
Submission Time:	2022-07-20 11:11:40	Status:	Pending

Circulation Information

State machine of a normal swap transaction




Txn Settlement

10. Transaction Node 1

10.1 Overview

Transaction Node 1 is a mock Transaction Node (TN) deployed in the Sandbox environment. Each Transaction Node can only process one single currency on one currency system.

10.2 Transaction Query

	<div> HOME TRANSACTIONS LIQUIDITY RELATIONSHIPS SETTLEMENT </div> <div> John Doe john@udpn.com </div>
<div>Transaction Management</div> <div> Balances: USDC 120 </div>	

10.3 Transaction Details Display

Basic Information					
DID	did:web@emagroup.eu:Zoo7HaeJ2mFtU2				
Transaction Type	Transfer			Amount	0.28 EUR
Source Currency	EUR-ETH			Target Currency	EUR-ETH
Source Account Address	0x0320d4dc1c0d874715d129d90d11932ae3038			Target Account Address	0x115c064c7f9bc33803f1160ff000e3cc230e46a3
Title Name	Thillingrull161			TN Code	TH00000028
Service Fee	1.10 EUR			Rate	--
Total Amount	1.40 EUR			Received Amount	0.28 EUR
Submission Time	2022-09-25 10:48:48 PM GMT+1			Status	Not processed successfully
Transaction ID	102902011_804000003_0d4d4d0d10d47a7b1610108DaeC0B1410108038				

State machine of a normal transfer transaction



11. Transaction Node 2

11.1 Overview

The Transaction Nodes supporting the Sender and Beneficiary currency must be selected before a swap. Each TN connects to a capital pool account supporting a single currency. In the first leg of the swap, the sender currency is transferred from the Sender's account to TN 1's capital pool. In the second leg of the swap, the Beneficiary currency is transferred from TN2's capital pool to the Beneficiary's wallet. The Sender must pay service fees for all transactions. Finally, TN 1 and 2 will regularly settle according to their agreed rulebooks.

11.2 Transaction Query

See section 9.2.

11.3 Transaction Details Display

See section 9.3