

基於區塊鏈的範疇三碳盤查

Blockchain-based Inventory of Scope-3 Carbon Emissions

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開發工具：Hyperledger Fabric、
Django、React、Docker、Nginx

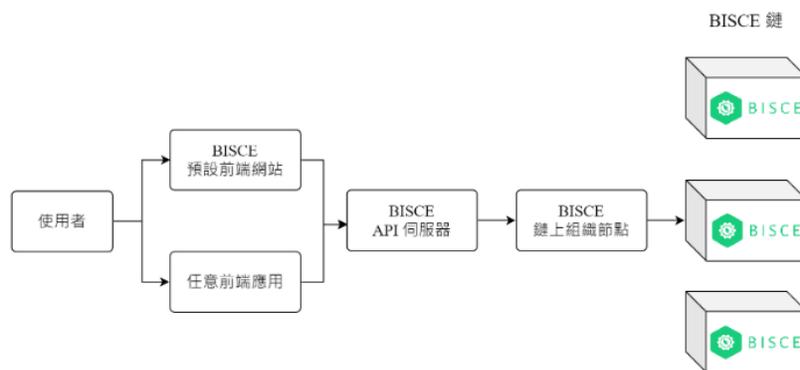
測試環境：Chrome

一、簡介

本專題旨在展示 BISCE 平台，一個基於區塊鏈技術的供應鏈碳排放追蹤解決方案。根據溫室氣體盤查議定書（GHG Protocol）的規定，溫室氣體排放盤查涵蓋範疇包括直接排放、能源間接排放和其他間接排放（範疇三）。然而範疇三中的碳排放數據蒐集和揭露對企業來說是一個巨大的挑戰。BISCE 平台以區塊鏈技術為基礎，展示一個實驗範例，提供供應商、製造商、客戶和其他合作夥伴組成的聯盟網絡，實現全供應鏈的碳排放量追蹤，同時解決碳排放重複計算的問題。

運作流程：

1. 每位使用者隸屬於一個組織，組織預設擁有一個由 BISCE 鏈上節點、與其嫁接的 API 伺服器與預設網站共同構成的 BISCE 服務。
2. 預設網站提供了 API 的可視化介面，使用者可以根據需要自由添加前端應用和伺服器嫁接。
3. 使用者的交易通過伺服器轉為鏈上操作，然後交由組織節點處理，組織節點以組織的名義在區塊鏈上進行交易。
4. 組織在計劃好每個季度的碳排放量（即代幣量）並完成 BISCE 服務的申請和架設後，即可開始進行交易。透過代幣流向的追蹤，組織能夠準確追蹤和管理碳排放情況。



BISCE 運作流程圖

二、測試結果

首頁交易紀錄：

The screenshot shows the BISCE Home Transfer dashboard. At the top, it displays the user's token status: My Carbon Tokens: 4700, My Used Tokens: 0, Total Supply: 5000, and Member ID: 0x693...30dfa. Below this is a 'Recent Transactions' table with columns for Time, Transaction ID, Event, From, To, and Value. The table lists four transactions, with the first two being 'Use' events and the last two being 'Transfer' events. A 'Show all' link is located at the bottom of the table.

Time	Transaction ID	Event	From	To	Value	
2023/05/21 15:27:03	8366e...a0886	Use	0x693...30dfa	0xebd...a76b4	100	Click for details
2023/05/21 15:25:37	a1cfd...a6f8b	Use	0x693...30dfa	0xebd...a76b4	100	
2023/05/21 15:24:21	1991b...afc86	Transfer	0x693...30dfa	0xebd...a76b4	100	
2023/05/21 15:17:17	b2198...4d0eb	Transfer	0x000...00000	0x693...30dfa	5000	

功能列表：

The screenshot shows the BISCE Home Transfer dashboard with search and transfer options. Under the 'Search' section, there are two input fields: 'Search the balance of an account' and 'Search the used balance of an account'. Under the 'Transfer' section, there are two input fields: 'Send tokens to recipient account' and 'Transfer the value amount from a specific account to another'.

交易執行畫面：

The screenshot shows the BISCE Home Transfer dashboard with the allowance execution screen. Under the 'Allowance' section, there is a form to 'Allow an account to withdraw from your account'. The form includes a text input field with the value '0x708ef6a32efdfad04729013d4afdca1a41fe5147', a number input field with the value '200', and a 'Submit' button. Below the form, it says 'Transaction committed successfully'. Under the 'Use' section, there is a text input field with the value 'Search for the amount still available for the client account to withdraw from the owner account'.