Viridis Network

A Decentralized Marketplace for Offsets

This paper is a high-level overview of Viridis Networks workflow and architecture for its Decentralzsed Carbon Offset Marketplace; one of the key components of our ecosystem.

1 Overview

The Decentralized Carbon Offset Marketplace (DCOM) is a groundbreaking project aimed at harnessing the power of web3 technology to facilitate the seamless integration of verified carbon offsets into the blockchain ecosystem. The core features of this system revolve around the creation of Non-Fungible Tokens (NFTs) representing carbon offset certificates and holding backing data, an ERC20 token named 'wCRBN,' and a mechanism allowing external users to generate NFT metadata (carbon offsets certificate) in exchange for wCRBN tokens.

2 Key Components

The key components here include:

- **Verified Carbon Offsets on Web3:** DCOM introduces a trustless and transparent system for verified carbon offsets within the web3 environment. This ensures that every carbon offset represented on the blockchain is traceable and has its relevant KPIs auditable on-chain.

- **NFTs (nCRBN) as Carbon Offsets:** Whilst our system aims to create a tokenized, and therefore fungible, representation of carbon offsets, these tokens are ultimately backed by NFTs that hold verified metadata about the underlying off-chain offsets that back them.

- **wCRBN ERC20 Token:** DCOM operates with a tier of native ERC20 tokens called 'wCRBN.' This token serves as the primary medium of exchange within the platform. Users can acquire wCRBN tokens through various means, including purchasing them on the open market or by authorizing the transfer of off-chain carbon credits via the nCRBN minting process. Going forward, the wCRBN umbrella will expand to multiple tiers of token depending on KPIs.

- **External User Metadata Exchange:** To enhance the decentralized nature of the platform, external users are encouraged to contribute by preparing metadata for the NFTs and transferring ownership of carbon offsets, which need to be signed by both the user and our authority wallet. In return for their contributions, these users receive wCRBN tokens, fostering a collaborative and community-driven approach to building a robust carbon offset marketplace.

3   Infrastructure Diagrams

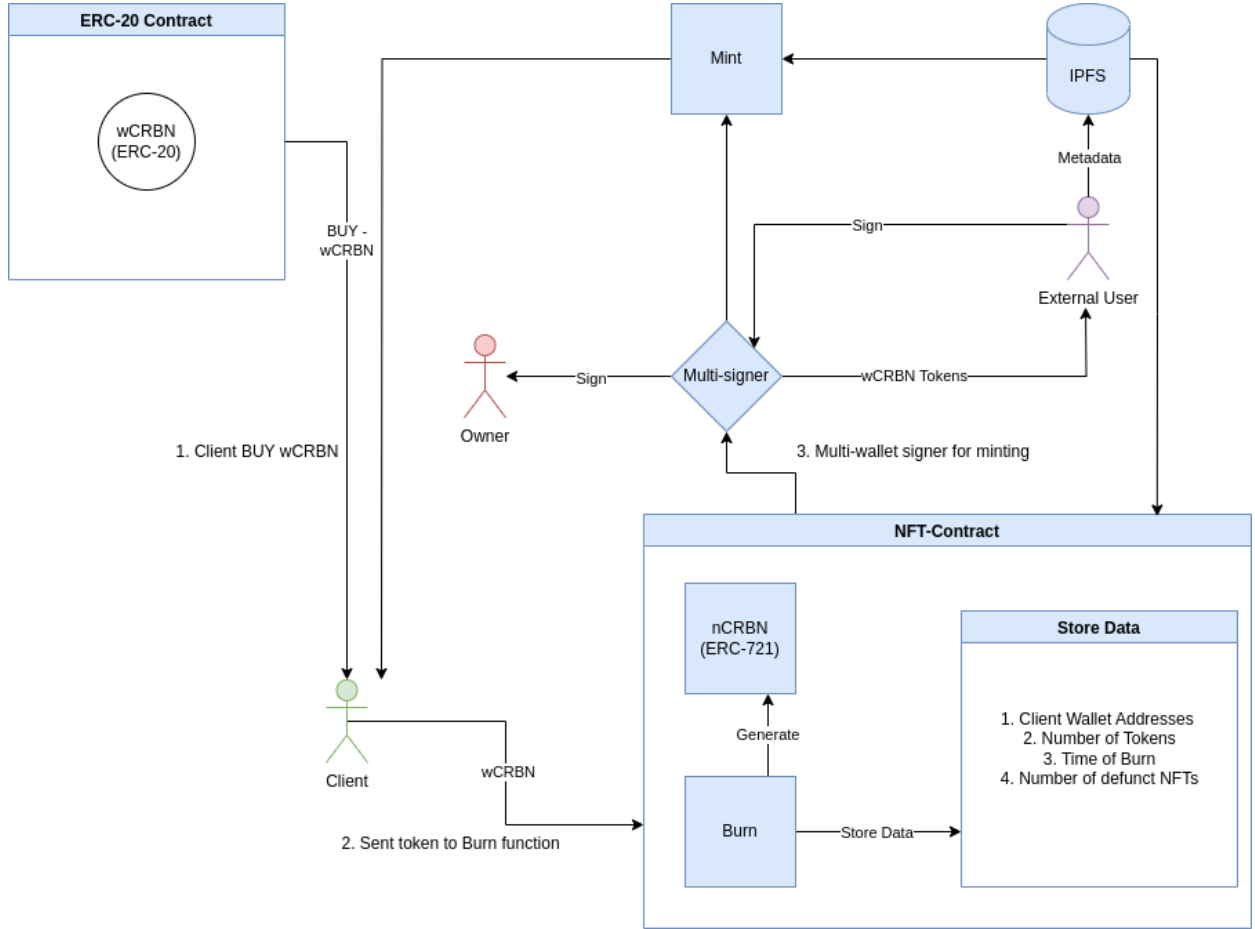We split the overview into two main perspectives; the overall ecosystem and the smart contract overview:

Figure 1: Project ecosystem

Steps for buyers purchasing wCRBN:

1. Buyers purchase a wCRBN ERC20 token on the open market, including at fractional levels (not limited to unitary purchases)

2. Users can interact, collect and store wCRBN tokens. In the future when there are different tiers of token, these tiers will not be able to directly commingle.

3. If a user or oganization wishes to offset their carbon emissions (in other words, take 'credit' for a certain tonnage of CO_2 offset), they approve and transfer wCRBN tokens to the issuing contract, which burns the tokens

4. As these tokens are burnt, they mint a certificate of offset (provided by Viridis, backed by our store of retired offsets) that certify the credited wallet, amount of carbon and timestamp snapshot (that can be cross-compared with Viridis' reserves at the point of this snapshot).

5. Buyers can then use this certificate to show on-chain that they have been carbon neutral or carbon-positive for a certain period.

Smart Contract Architecture

We also present a more detailed smart contract overview of interactions that occur for the generation of wCRBN.
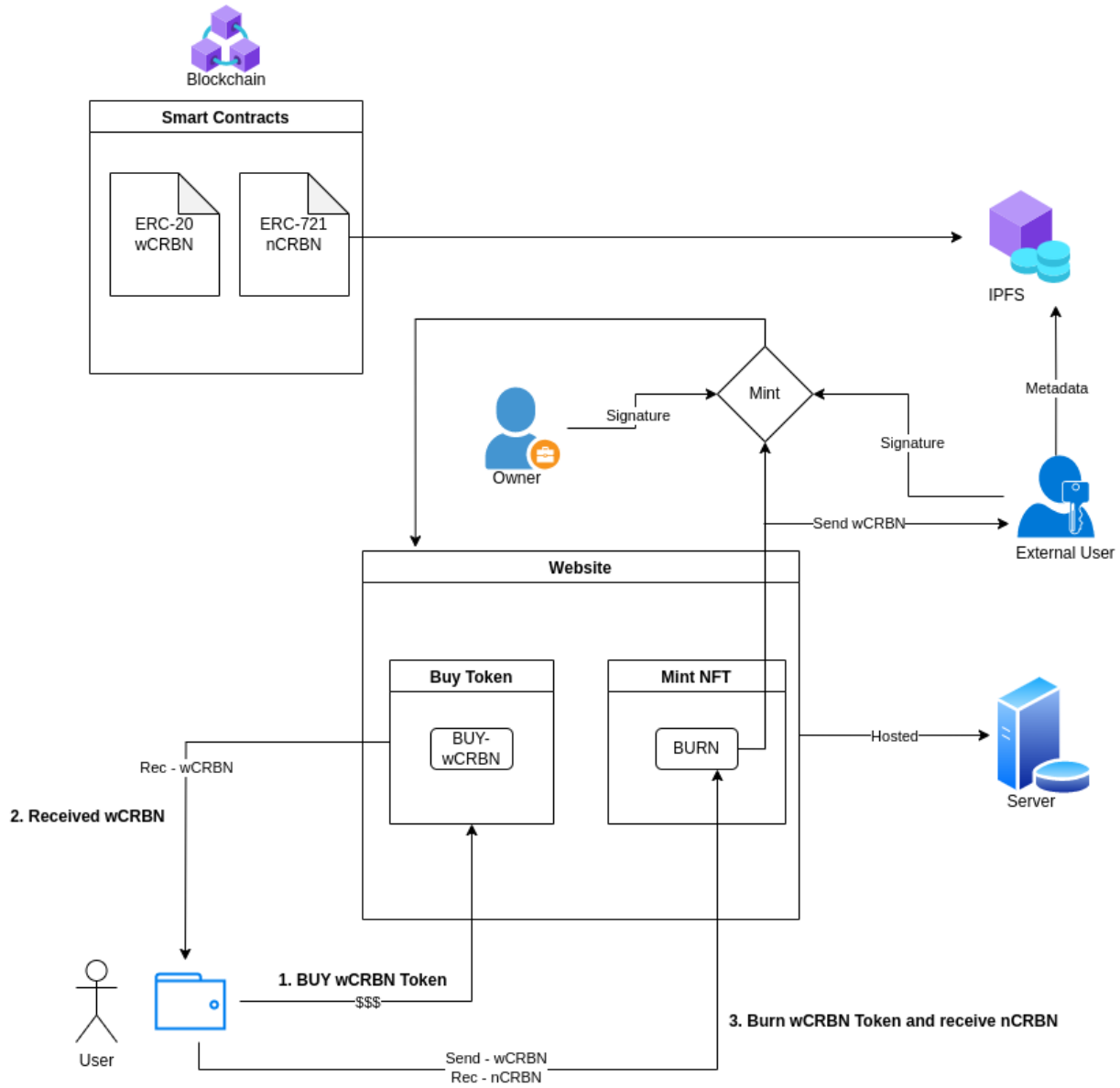

Figure 2: Smart Contract Overview

Steps for suppliers generating wCRBN

1. Suppliers secure from suitable providers measured carbon offsets

2. They attribute the offsets to one of our legal hubs via our dashboard, and authenticate themselves as the original owner

3. They also upload on-chain backing information for the offset including the provider, quantity of carbon, date, type of offset, etc

4. From there, our authority places the credit into the correct category and, if all is suitable, countersigns the creation of x wCRBN tokens in accordance to the certificate

5. Our authority also retires the offset and attributes it to Viridis

6. The supplier countersigns if in agreeance with the authority determination, which leads to the simultaneous creation of the backing nCRBN backing NFT and the appropriate number of wCRBN tokens minted to the owner

Next Steps

Having outlined this architecture for our solution, we are building out an end-to-end MVP functional on ETH mainnet, that will then be ported over to the upcoming Viridis Chain.