

## ***Phase 2-of-4***

Clearinghouse & Settlements Layer

WhitePaper v0.1



# Overview & Synopsis

The Purpose of this paper is to present Carbon, a blockchain & crypto-based ecosystem for the provision of a settlement clearinghouse for the medical records industry. In this document we explore the second layer [2-of-4] of the HealthCore systems. This document is meant to service the general public as well as industry professionals with a high level understanding of the topic. After acclimating himself with this document the reader should become acquainted with the proposition presented by LifeRhythm Medical Services LLC in the provision of the Carbon project. Here we will briefly begin to touch on and introduce General technical concepts.

All other concurrent layers of the project [1, 3 & 4-of-4] will be available in accompanying documentation. Let the reader be advised that all related documentation is formatted to be chrono-neutral (read in any order) but all reflect the core ideas expressed in this paper.

Layer 2 of the HealthCore project has been given the name Carbon to reflect the delicate relationship established between the element Carbon & natural biologic life. Carbon is known to be one of the most powerful & malleable elements, due to its atomic structure, creating powerful resources such as diamonds & flexible resources such as graphite. From within the HealthCore project, Carbon services that role exactly; a maximally accessible & theoretically infinite environment for the settlements of payments.

Carbon does not operate as a standalone technology, rather it is codependent on the data that passes through it from its surrounding layer 1 (Hydrogen) and layer 3 (Nitrogen) applications.

The HealthCore ecosystem leverages a three-tier token incentive mechanism for its operations, a Non-fungible ERC-721 token for identity that is coupled with an ERC-20 token for governance \$HYGN / \$HYO (*please refer to Phase 1 documentation*) & the HC-1 coin for the provision of economic settlements known as \$CRBN.

*The HealthCore ecosystem is a software deployed to the hyperledger fabric blockchain as a series of smart contracts focused on the provision & storage of medical data.*

*LifeRhythm Medical Services LLC. is the ambitious medical arm of LifeRhythmLabs INC.; an organization that provides a full suite of software technologies for the decentralized digital age of WEB 3.0.*

# Terminology

**Carbon**: the settlement layer application in the HealthCore ecosystem.

**Blockchain**: a structure of data which is immutable, provable, transparent and traceable.

**Ledger**: a log of all information pertaining to a subject which acts as a single source of truth (ex: a medical journal where all licensed heart surgeons must be listed)

**Settlement**: the irreversible final state of a transaction

**Hyperledger Fabric**: highly modular, enterprise grade blockchain software environment & library provided by HyperLedger foundation & powered by its own novel HackSaw consensus mechanism.

**HCC**: Abbreviation for HealthCore-Chain & the name of the native HealthCore blockchain environment.

**HC-1**: Token standard that is developed on the HealthCore Chain

**Machine Learning**: The specific branch of artificial intelligence dealing with the recurrent self-sovereign-education of a mechanical non human entity.

**WEB 3.0**: Term used to refer to the future of connective technologies.

**Fungible**: state where two items are interchangeable and indistinguishable from one another (ex. 1USD = 1USD)

**Ethereum**: a turing complete blockchain based smart contract platform

**EVM**: Ethereum Virtual Machine, computational hyperspace for blockchain applications based on ETH

**ClearingHouse**: a random group of trusted validators for the processing of events on the HealthCore-Chain.

**Maturing/Maturation**: the event of converting \$CRBN tokens into \$HYDRO tokens through a coin burn.

## ~ Carbon Application ~

Welcome to Carbon, a value transmission layer technology designed to act as the native settlement clearinghouse for the HealthCore medical ecosystem. The first technology of its kind designed to keep all resources native within one ecosystem.

### Consensus

The Carbon layer of the HealthCore ecosystem is where the economic consensus is found. Known as Clearinghouse-Consensus, Carbon employs a novel approach to PoS [called Open-Proof-of-Stake] where weight distribution and selection in the environment is driven by three factors: reputation, availability, and randomness.

In order for ecosystem participants to become a consensus node, they must first obtain the satisfactory threshold of “High enough” reputation; at which point they automatically get plugged into a queue to participate in consensus.

Once in the queue, the participant node is evaluated across multiple dimensions of availability; The frequency of activity on the platform, the quality of activity on the platform, their willingness to pledge an absolutely minimal amount of their devices computational capabilities (mobile friendly) and a few other metrics that are kept proprietary in order to avoid gaming of the system.

Finally, at the core of consensus lies the randomness engine that will dictate the amount of participants and whom those participants are at the start of each verification round.

Alongside the introduction to consensus there also exists the expulsion from it; should there be any malicious activity confirmed by a consensus participant, a 3 severity punishment mechanism is engaged.

#### **Severity level 1**

A temporary removal from consensus and temporary freezing of all associated assets is conducted (Up to 7 days) *{reputation is minimally impacted}*

#### **Severity level 2**

A prolonged removal from consensus (up to 180 days), A small [~17%] slashing in token holdings its conducted (slashed tokens are permanently removed from circulation via burn) temporary freezing of remaining associated assets is conducted (Up to 90 days). *{reputation is moderately impacted}*

#### **Severity level 3**



## Layer Objectives

Carbon will be developed and pursued in parallel to other layers of the project. This layer is composed of 4 strategic objectives:

1) →	Provide Clearinghouse Parameters
2) →	Carbon Generation
3) →	Streamline Interoperability
4) →	Secured Storage

### **1) Provide Clearinghouse Parameters**

Rather than leaving a medical ecosystem susceptible to the uncertainties that are present in Proof-of-Work environments; LifeRhythm Medical Services has chosen to opt for a more deterministic Open-Proof-Of-Stake {[O-PoS]} system (based on the ERC-20 governance \$HYO tokens which are distributed initially in phase 1). However, in order for computation to take place on-chain, nodes that are participating do allocate an absolutely minimal amount of their device's resources (as in the case with PoW based consensus mechanisms).

Everytime a settlement or transaction takes place on the HealthCore platform, a random segment of participants (random in node count and identity) are selected to act as the Clearinghouse agents for that event to take place. Everytime a user participates in the clearinghouse consensus they are rewarded with newly minted \$CRBN tokens, an amount that will be defined at a later date in accordance with the overall system's capacities.

If the tokens remain untouched for X amount of time (30 days) they mature into \$HYO tokens. (\$HYO tokens have a fixed base supply and new tokens can *only* be created through the Clearinghouse Maturation method). This systematic approach has been defined as the most pragmatic for a healthy & sustainable form of progressive decentralization to take place.

Throughout the first year of operations, the parameters of selection and reputational criteria will be dynamic; once a satisfactory state is identified

the ecosystem will participate in the governance process of “locking-in” the clearinghouse parameters for a minimum of 6-months; after which new proposals can be submitted for the change in parameters.

## 2) Carbon Generation

The generation of \$CRBN coins is at the core of phase-2 plan of action. Generation of the supply can only begin with the presence of a base \$HYO token holder group defined & @lpha-clearinghouse parameters in place.

Initially, the ratelimit of production & supply capacity is left undefined. The platform will decide on the rate in accordance to the following metrics:

- Supply
- Demand
- User Base
- User Activity
- Computational Availability
- Data-Density (Medical Records on Chain)

## 3) Streamline Interoperability

Interaction between the token sets ( $\$CRBN \leftarrow \$HYGN \rightarrow \$HYO$ ) is predicated on the HealthCore Chain being able to communicate with the Ethereum Chain; this is accentuated beyond EVM compatibility due to the complexities associated with NFT (non-fungible tokens) being cross-chain communicative.

Traditional medical record systems are void of blockchain & crypto token structures, however for the importing of records onto the HealthCore platform there will be the need for both forms of technology to communicate & pass data to one another. Whenever data is passed into the HealthCore Chain it will demand \$CRBN tokens to be consumed (as a measure against DOS/DDOS of the system).

Moreover, within and of itself, Carbon will not have its own separate application, rather it will be integrated into the user facing Hydrogen application. In doing so, the user experience becomes much cleaner and more organized.

## 4) Secured Storage

The Carbon token will have to be stored somewhere & in the nature of public blockchain technology LifeRhythm Medical Services LLC has

chosen to give full sovereignty over the \$CRBN coin to its direct owners. Thereby making LifeRhythm Medical Services LLC **NON-CUSTODIAL** {[ however there will be extended custodial solutions offered at some point]}.

However, in the provision of self sovereign storage comes the overly un-user friendly experience of key management. As a solution, at the beginning 3rd party non-custodial solutions will be integrated into the Application. Additionally, once a native wallet is introduced, its source code will be made publicly available for developers & community members to verify its airtight design and build new solutions.

## CRBN (Tokenomics)

The \$CRBN coin will be deployed on & integrated into the native HealthCoreChain blockchain platform; thereby immediately allowing for enterprise clients to connect and participate in the Carbon ecosystem.

<b>Token Name:</b>	Carbon Coin
<b>Token Ticker:</b>	\$CRBN
<b>Token Supply:</b>	NitroBase + Census CoE-Velocity-Demand
<b>Decimal Points:</b>	18
<b>Platform:</b>	HealthCoreChain
<b>Token Standard:</b>	HC-1
<b>Token Function:</b>	Accountancy & Settlement
<b>Token Class:</b>	Utility

### Name & Standard:

\$CRBN is defined as a coin rather than a token due to its naturally designed capacity to have other coins/tokens built on it as well as it serving as the exclusive means of accommodating the HealthCoreChain network fees. (HC-1 standard)



## Function:

The \$CRBN coin serves 2 distinct functions within the HealthCore environment:

**Accountancy:** whenever we consume food we denominate its impact on the human body in calories; whenever we make a purchase in the United States of America we denominate it in USD; likewise the \$CRBN coin is intended to serve as the native denomination of medical service consumption.

**Settlements:** guaranteeing finality remains to be one of the most complex components in any financial environment, specifically regarding returns, fraud, costs, finality and time requirements; taking into account that the \$CRBN coin will leverage the computational consensus capabilities of the HealthCore Chain, the LifeRhythm Medical Services has identified the optimal parameters for finality in medical services.

## Supply

The Supply of \$CRBN is defined through a data-driven supply/demand dynamic, with no lower bound (positive integers only *{no-debt system}*) or upper bound. Just as in biologic life that more people on earth means more carbon emission, The production of \$CRBN in the HealthCore ecosystem is contingent on the population within the ecosystem and the specific demands of each participant. At a high level \$CRBN is introduced into the ecosystem in 2 ways:

1.) Data Record Demands	2.) ClearingHouse Consensus
<p>As medical records come into the HealthCore system, the network will emit \$CRBN to accommodate the storage and computational bandwidth each record requires.</p> <p>The emission is deposited into a time-locked vault for validation of uploading parties intentions. Once cleared the \$CRBN is given to the uploading party, empowering that party to make <i>write</i> requests to the HealthCore Chain</p>	<p>Participating in the platform's consensus entitles the participant to rewards denominated in \$CRBN.</p>

The supply emission rate is a constantly moving target in the HealthCore ecosystem. Users that have high reputation and activity standards will produce greater amounts of \$CRBN while those with lower standards produce less. As of last, no cap has been placed on individual production, however, the possibility of one being imposed at some point in time remains open.

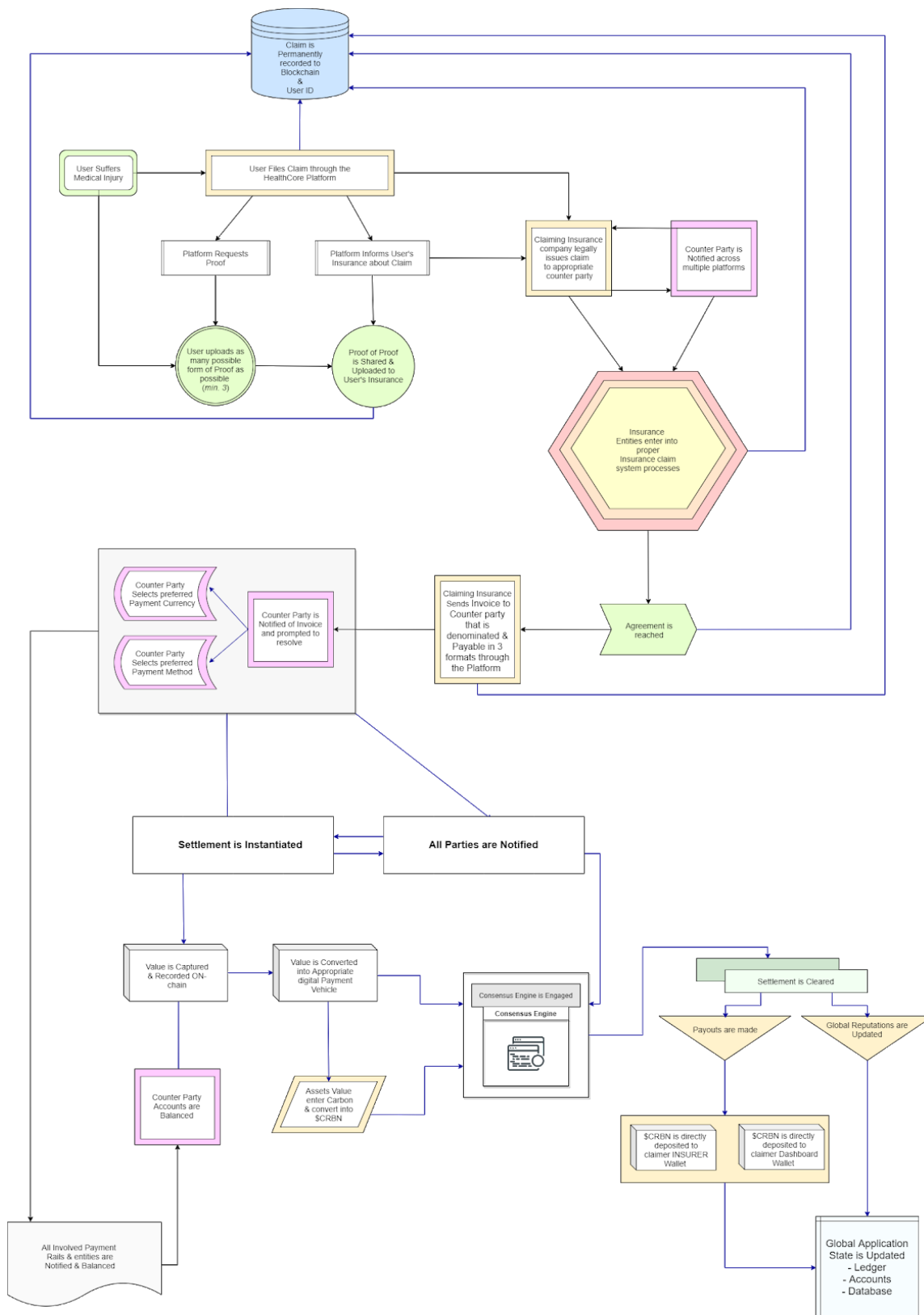


Figure 2.2 3rd party Settlement Process

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