



LIFERHYTHM
MEDICAL SERVICES
LLC

HYDR OGEN

Phase 1-of-4

Data Layer & Ledger

WhitePaper v0.1



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Abstract

The industry of Medical information serves as the apex metric to gain insight into the population's global health and well-being. Given how critical of a role this industry plays it comes as a shock & a disappointment that this industry is heavily reliant on con-current industries to guarantee

- + **Privacy** - is all sensitive information obfuscated to a satisfactory level
- + **Authority** - how can we validate and segment control rights to the data. Who can access the data & when can they access it.
- + **Accessibility** - how can we guarantee that only those who are authorized to access data actually access it when needed and not someone else.
- + **Regulation** - different governments have different frameworks in place as to the structure of information in relation to public good and services.

Welcome to Hydrogen, a data storage layer technology designed to act as a Ledger for the medical ecosystem. The bridge between the legacy medical information systems and WEB 3.0.

Terminology

HydroGen - the term used to reference the base 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)

Hyperledger - enterprise-grade syndicate of blockchain software professionals.

Hyperledger Fabric - highly modular blockchain software provided by HyperLedger team.

Smart Contract - The specific branch of artificial intelligence dealing with the recurrent self-sovereign-education of a mechanical nonhuman entity.

NFT - Non-Fungible Token.

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

HealthCore - The name of the medical application suite being developed by Liferhythm Medical Services LLC.

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

Overview & Synopsis

The purpose of this paper is to present Hydrogen, a blockchain & crypto-based ecosystem for the provision of medical data. In this document we explore the ground layer [1-of-4] of the HealthCore systems.

Hydrogen is the name given to this portion of the project due to its role as the foundational building blocks of the HealthCore ecosystem. In biologic life Hydrogen is the building block of atoms thus the building blocks of life; Hydrogen by LifeRhythm Medical Services LLC represents just that. All accompanying technologies and applications are dependent upon or related to Hydrogen. The term Hydrogen is used to refer to the user general architecture maintaining the backend processes, more specifically the data registrar and medical records ledger.

This document is meant to service the general public with a high-level understanding of the HealthCore Platform. After inspecting this document the reader will become acquainted with the proposition presented by LifeRhythm Medical Services LLC in the provision of Hydrogen. General technical concepts will be described but kept to a minimum for purposes of coherence.

Further phases of the project [2, 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.

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.

Hydrogen (Data Aggregation)

At a high-level Hydrogen is the first layer of a multi-layer project intent on providing a software ecosystem built leveraging blockchain technology for the purposes of providing a distributed, trusted, private, secure, & robust environment for the storage and management of the medical records & services.

The application & its ecosystem will exist in the HyperLedger Fabric, a highly modular, highly secure, stable, and scalable consortium style distributed ledger technology. Being WEB3.0 compatible, the Hydrogen core system is maintained through a dual-token structured consensus mechanism.

The overarching goal of the Hydrogen layer is to be able to introduce and maintain as many initial independent actors into the ecosystem as quickly as possible; while guaranteeing accuracy, privacy, and security for their information.

The Hydrogen layer is essentially broken down into 3 core objective:

1) →	Data Aggregation
2) →	Data Management & Protection
3) →	Token Dissemination

Data aggregation means two things within itself: 1. the introduction of as many new agents into the ecosystem as quickly as possible 2. Uniting as much medical information as possible.

Data management and protection revolves around the more intimate principles of how data is handled once it is pushed onto the platform.

Finally, Token Dissemination references two concepts as well: 1. The Creation of as many NFT's as possible 2. Having every account/NFT circulate at least 2,500 tokens over the course of a year.

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 &

the HC-1 coin for the provision of economic settlements known as \$SCRBN (*please refer to Phase 2 documentation*).

Taking into account that the very core problem of the medical data industry has to do with availability & accessibility (who, when, and how fast can information be obtained), Hydrogen has been designed to deal with just that.

The Hydrogen ecosystem addresses verticals of the Medical industry pertaining to: Medical data storage & management, privacy of sensitive information, insurance, payments, & predictive pharmacology.

The Hydrogen application layer has been equipped with a data framework for Medical Professionals to participate in. It is capable of handling radically varying structures of data and harmonizing them into a standard which is capable of communicating not only across blockchains but across disparate technological environments as well.

At launch, Hydrogen is intent on targeting as wide an audience of medical professionals as possible. Factions of the medical industry from General Family Practitioners, Dental providers, Optometrists & Dermatologists to Heart Surgeons, Neurologists, Psychologists & beyond; in the event of alternative specialists signing onto the network, there is a man-maintained back-system which process them off-chain.

All participants of the ecosystem that are Medical Providers will undergo a robust verification process: uploading their certifications as well as proving pre-existing field experience, peer verification, their listings medical journalism etc. At a later point, Hydrogen will be integrated into the existing legacy system to provide a fluid informational onramp for professionals; ideally the process will become as simple as connecting a Google+ account with a Facebook account & provide security measures of military-grade financial institutions.

After registering and once their claims have been verified, the practitioners will gain the rights to read and write to the dedicated listing ledger. The listing ledger is where regular users are able to source their medical professionals from; this can be thought of in terms of already familiar examples with systems like ZocDoc, Yelp, etc.

Every MP (Medical Professional) account comes with expanded token functionality of staking. Medical professionals cannot buy \$HYGN tokens,

they are only able to accrue them through maintaining their reputation according to how many end users are willing to validate their practices by delegating tokens to their preferred MP's.

Hydrogen

(Data Management & Protection)

Blockchains are notorious for their data permanence and availability. Once something has been introduced into a blockchain it cannot be removed, and if removal is attempted then that action of removal is recorded and appended. Moreover, that data can always be requested for or checked on. This causes distress for individuals; why would somebody want some kind of personal medical information existing in digital hyperspace?

The most obvious and direct answer can be found somewhere on the spectrum between emergency situations and information availability. To put things into perspective one needs to image themselves in a situation; traveling around the world with allergies.

Barry, born in the United States, was born with peanut allergies. He turns 27 years old and heads out to explore the world. Landing in Mumbai India after his long flight from Tokyo, Barry decides to go grab some street food. Biting into a juicy piece of Curry Chicken he all of a sudden realizes his breathing is getting difficult and his throat is swelling. Right before he passes out he yells out HEALTHCORE APPLICATION. Rushing him to the emergency room, the Nurse, Raj, cannot figure out what is causing this reaction. The journey to the hospital is 30 minutes and if Barry isn't treated with something in the next 10, he might not make it. Now traditionally to get medical patient records the hospital would have to call the US embassy, that would have to call some health organization, who would call his personal provider, who would then give them a hard time accessing the records because of fraud & security reasons. Luckily, when Barry yelled out HEALTHCORE he activated the widget, which will ping a flashing signal to inform Raj that there is some information available. Seeing this Raj signs into the platform and requests emergency information on Barry by scanning his fingerprint - the response from the platform does not forfeit any sensitive data, rather it simply states that this is a person with XXX Allergies to food/medicines & XXX neural conditions. The entire process that traditionally takes 5+ parties and no less than 30 minutes has been addressed in a matter of seconds. Raj injects some antihistamines into Barry. Barry

regains consciousness thanks Raj and asks where the closest food trolley WITHOUT peanuts in their curry sauce can be found.

The HealthCore platform very carefully segregates information by sensitivity; where emergency data is presented in an abstract format and must be requested through a multi-signature scheme. The Multi-sig scheme is bound with a tiered 5-factor approach,

Application ↔ Device ↔ Biometrics ↔ Wallet ↔ Password

In this 4 factor scheme, any combination of requests creates its own specific level of accessibility permission; where 3-of-5 will provide abstract meta-data and 5-of-5 will provide almost any request depth.

Moreover, understanding the consumers need for peace of mind, data that is pushed through the application will exist only within the local application space (device drive) for a certain period, after which it will be pushed to the HCC blockchain permanently; once there it cannot be taken down.

Extending the measure of protection all the more, every piece of data is sharded into 31 components and randomly sent throughout the network. No one piece can register any data without the remaining pieces, moreover, even if 31 pieces are to be united it cannot unlock the information hidden within them unless a handshake is established between the data & its according device & wallet, confirmed by the passphrase and a biometric thumb scan.

\$HYO & \$HYGN

(Token Dissemination & tokenomics)

The Hydrogen application and its constituent following 3 ecosystems are maintained and governed through a dual-token consensus structure. The Hydrogen phase is of utmost importance given that it will serve as the point of initial dissemination of the \$HYO/\$HYGN tokens. For medical patients, the token serves as a formal identifier within the ecosystem; as well as providing a Sybil mechanism (a form of extended security against malicious actors [specifically spam]).

Token Name:	Hydrogen Token
Symbol:	\$HYGN / \$HYO
Supply:	<i>X:1 + reputation variable / 500,000,000 +mint & Burn</i>
Blockchain:	Hyperledger/ Ethereum
Standard:	ERC-721/ ERC-20
Function:	Access Rights & Governance

The tokens will initially be deployed on top of the Ethereum Blockchain as ERC standard assets. This has been decided upon as so due to the widespread recognition of the ERC as the global token standard; interoperability is key in the long term suitability of the HealthCore project.

The first token is called the \$HYGN token; HealthCore's solution to the industry problems of accessibility and authority. Within the HealthCore ecosystem, the \$HYGN token acts as an identifier. Every new account that is created on the Hydrogen platform is immediately issued a "digital twin" in the form of an NFT (non-fungible token). That digital twin represents the identity of the patient or medical professional; once issued it becomes permanently tied to the requesting wallet and begins to establish a reputational metric (which later impacts the supply side of the \$SCRBN token (please refer to the Phase 2-of-4 documentation). The NFT grows and develops as would a profile on social media or an avatar in a game, going through levels of advancement and obtaining social validation. Wallets that do not have the ERC-721 \$HYGN are not able to interact with the Hydrogen environment. The more complete an NFT becomes, the more data that is associated with it, the more weight it acquires in global decision making events (a.k.a Governance pressure).

In addition to every account having its own according NFT token for accessing information and helping in the governance processes, every account is balanced with an appropriate amount of ERC-20 \$HYO tokens. From launch, the \$HYO tokens are capped at 500,000,000 tokens. The token acts as a vehicle to capture "credibility" and its fluctuations depending on resource availability as well as governance. The tokens can be consumed

immediately for some platform services (primarily establishing trusted communication channels). If not consumed, they can be lent out to other entities (delegated) in return for some micro-financial gain [{to be denoted in \$CRBN}]. \$HYO token balancing follows a logarithmic distribution model; the more reputation an account has the more \$HYO it produces and the more it can hold. However, the more \$HYO a wallet has the less and less it produces over time. The supply elasticity is further exacerbated with the introduction of a global state cap variable; there cannot be more than 2,500 tokens in any given balance at any time

At some point in the not too distant future, the \$HYO token will be considered being made available for open market trading. Moreover, the HealthCore team is exploring the expansion of the \$HYGN non-fungible token, leveraging its reputational & identity capabilities to service the greater LifeRhythmLabs ecosystem as a form of Decentralized Identity.

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