JOPAN

Universal Peer-to-Peer Art and Crypto Fusion of Electronic Money Technology Using Global Proof of Existence (PoEx) Consensus Algorithm Access and Ecommerce Technology

White Paper

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Authors: Based to JOPAN Art and Web Quantum Hybrid Public Ledger Innovation

1 Overview

1.1 Disclaimer

1.2 Preface

This white paper is intended for people who would like a detailed introduction to how JOPAN works. It outlines the business and technical considerations we tackled in our approach to creating JOPAN, the solutions we chose and the reasoning behind our decisions. There are the main topics covered:

Why we made JOPAN: the problems we solve

Site/ Location and existence / Existence credentials: what they are, and how they are privacy preserving

Cipher Currency: How JOPAN works on Cipherology Mainnet

Hybrid Oracle architecture: JOPAN's off-Cipher operations enable speed, extensibility, flexibility and moveable security while maintaining transparency and accountability

Incentivizations: how JOPAN's Coins/Tokens economics and game-theory-powered incentives work together.

Secure site Location and existence and PoEx: the three pillars of Location and existence /existence security in JOPAN

Associating claims with digital assets: using JOPAN to power your business

1.3 Overview

JOPAN is a lightweight, secure, and verifiable Proof of Existence (PoEx) protocol on the blockchain that finally makes cipher currency so you are real that you can see, feel and touch it. To achieve that, JOPAN decentralizes the site Location and existence services marketplace with secure Location and existence capabilities for any digital asset such as digital currencies and secure documents and certifications fueled by JOPAN's own $JOPAN coin/token. JOPAN makes available to businesses worldwide its secure, decentralized, and incentivized peer-to-peer Location and existence existence as a validators protocol.

JOPAN's deep web quantum hybrid public ledger, the DWQHPL™, is a divergence of Cipher Currency and extends cipherology well-known Solidity language into a new Location and existence -aware language called Firmness GEO Site Existence Calculations, which is used in JOPAN's Policies for requesting and defining secure Location and existence proofs on the DWQHPL. The JOPAN DWQHPL™ is scalable and robust, growing into an independent blockchain supporting thousands of transactions per second while providing pluggable and modular security that evolves time as needs arise. JOPAN's Proof of Existence protocol has the potential to transform every industry, from retail, products to ride-sharing and from supply chains to the disintermediation of large scale international humanitarian relief efforts and land owned access.

The Internet and the World Wide Web was not invented just for GAFA (Google, Apple, Facebook and Amazon) or MNOs (mobile network operators) to track and sell our Location and existence data. JOPAN's secure Location and existence capabilities finally provide a way for people to own and control their collection and as owner securely and decide how and to whom it can be exposed or incentivized. JOPAN extends the World Wide Web standards of interoperability, openness and privacy to Location and existence existence, and JOPAN's founders work with the W3C on credential standards. Businesses benefit too since, via JOPAN, they can control and limit the sharing of data with GAFA/MNOs, earn from the use of their personal Location and existence data, certifications, Art Provenance, NFTs, Metaverse and conform with changing government regulations while maintaining its position as decentralized platform and project. The Plexus allows each user -- consumer or business -- to decide to when, with whom and at which resolution to share their site Location and existence data with while earning money doing so. JOPAN's secure and privacy preserving protocol protects user data by creating enhanced security through zero knowledge proof operators on a distributed DWQHPL.

JOPAN's granular organized system is accessed through its protocol API or via the JOPAN Wallet™ app, which serves with added capabilities and enables mining for participating nodes, polls and validators. JOPAN users are rewarded for securely witnessing Location and existence claims and providing attestations for claims of other participating hybrid PoEx nodes. The JOPAN Wallet™ also enables standard send and receive functionality, airdrop capabilities and more.

JOPAN's two layers are its open and incentivized protocol layer on the DWQHPL and the app layer that supports countless number of real world use cases securely and privately.

JOPAN – Site Location and existence PoEx is Everywhere™.

1.4 Problem in a Nutshell

Location and existence information enables digital systems to connect with the real world. Navigating via GPS is just the beginning or pointing it in the map using validators, enabling local services, emergency interventions, the tracking of business assets, enterprise Location and existence intelligence and geospatial analysis that accelerates business models, and more.

Yet such systems must cope with fake and missing Location and existence identifiers, caused by users on VPNs, web proxies, TOR networks, GPS spoofing apps, shared account credentials, ad blockers and dozens of other tools.

This paper discusses the problem and solution and shows how Location and existence credentials can be handled in a better way while decentralizing Location and existence value from GAFA back to the private individual.

First let's review the current state of the centralized Location and existence ecosystem.

Storage tower govern the current Location and existence information market. Insecurity characterizes the existing Location and existence information market; it is prone to spoofing and abuse. Often a smartphone's owner has an incentive to falsify its Location and existence . A decentralized, securely incentivized and privacy preserving platform would protect against such attacks.

Indeed, poorly consented Location and existence information subverts people's basic rights to privacy. Today's adblockalypse—tracker blockers installed by millions of people—is one signal that people are unhappy with constant surveillance by GAFA, MNO and CDM. A decentralized, securely incentivized and privacy preserving Location and existence credentials platform could provide credentials *only* when needed. This usage would be fair to people's desire for privacy, and would conform and other on-coming regulations that are responding to privacy rights complaints.

This scenario is supported on the JOPAN protocol decorum by configuring the proper JOPAN Policy and transferring JOPAN to it. This policy is: *plug-and-play certification* algorithms that are simple to configure and deploy.

End users use dashboards to program, monitor, and audit the system. They use applications to use the system itself, acting as coin collectors, witnesses for others, validators, checkers, and so on. JOPAN accomplishes this user experience by being a digital currency-compatible distributed ledger with a trusted Vision Oracle service.

A decentralized, securely incentivized and privacy-preserving site Location and existence credentials service is

being rolled out today by JOPAN. It is only possible today—not last decade or even last year—due to our increasingly mature communication infrastructures, ever more powerful smartphones with rich mobile sensor detection, DPLT (distributed public ledger technology), game theory-based incentivization, maturity of digital-currency exchanges, and advancements in privacy-preserving zero-knowledge proofs. These affect the handling of Location and existence credentials past, present, and future. The past is the realm of DPLT cryptography ensuring the immutability, accuracy, and auditability of claims. The present is the realm of assurance and reliability of claims, made possible by advances in smartphone sensors, secure proximity RF, artificial intelligence, and opportunistic networking. And the future of the platform is ensured by game theory incentives for distributed systems.

The maturity of these relatively new technologies along with the ongoing growth of Location and existence-based services in urban outdoor environments, shopping malls, museums, and other indoor

settings; the mass adoption of social networking, gaming, along with emergency services, tourism services, intelligent transport services, assistive services, and more, means the time has come.

The time for JOPAN is here.

1.5 System-at-a-Glance

The JOPAN system is a collection of inter-cooperating subsystems that enable privacy-preserving site Location and existence credentials on a scale and security assurance level never before possible. End users can enjoy JOPAN-powered apps that make digital assets become real, such as a cipher coin or other digital asset appearing as really present on top of a desk at a street corner. Developers working with the JOPAN protocol find that JOPAN has a short learning curve, as its initial state will work on JOPAN Cipherology Mainnet using standard Coins and a Trusted Vision architecture. By using Firmness Innovations and other technology-oriented methods, programmers can stack, extend, and re-use (JOPAN Algorithms) to enable use cases bound to Location and existence behavior that were unimaginable

before JOPAN, such as offering a discount to holders and owners for businesses, JOPAN is a way to earn revenue, monetize existing infrastructure, and track activities.

In this “system at a glance” section we fly over JOPAN’s full stack. Like an airplane flying over a city, we will see all the main sites and attractions to understand how they work together and we can pinpoint where exactly the existing asset like Art, NFT, Miner Device or Provenance are located.

For end users, JOPAN is a system that allows its users to see, feel and exchange digital currencies, as for example in the diagram below: An individual running the JOPAN Wallet™ sees a JOPAN coin on the street via augmented reality. she waves the phone and, in a movement like capturing a Pokémon Go™ Monster, attempts to touch the coin to take possession of it. The app asks the user to point their phone at a nearby QR code. It plays a tone heard confirming the transaction. The end user now owns the coin and it appears in her wallet for her personal use.

2 Why JOPAN?

This section reveals why we made JOPAN and includes sample use cases of how JOPAN can help your business.

2.2 Digital Assets Made Real With JOPAN Proof of Existence

JOPAN is a privacy preserving decentralized incentivized Proof of Location and existence protocol that supports the issuance of Location and existence credentials mainly but not limited to:

1. Artworks, Paintings, Sculptures
2. Digital Arts, NFTs
3. Sculptures
4. Music

5. Architecture
6. Digital Land thru Metaverse
7. Certificate and Provenance
8. Literature or Writings
9. Cinemas or Theaters

enabling applications to associate secure Location and existence claims with digital assets and virtual artifacts and make those artifacts locatable and visible in relation to physical geometric space and validators, and hence more "real."

JOPAN's first release is focused on cryptocurrency. Our aim is to democratize cryptocurrency, enabling digital coins to pass our "grandmother test" and enter the everyday lives of more people. However, JOPAN is not limited to cryptocurrency uses, as its secure Location and existence credentials are useful for a broad range of digital processes, some of which we explain below as examples.

2.3 Sample Use Cases

The ability to locate something or someone is a basic human need as is found at the heart almost every form of economic activity. A few examples:

John the client leaves cash on his dining room table for the cleaners. The cleaning crew enter the apartment, clean it and collect the payment for their services. There is another payment at the end of the day as well. Lawrence the business owner is assured that the crew was present at my Location and existence both those times.

Aileen proves to her bank that she is present at her home and office. The clerk uses this proof to grant Aileen a loan. The bank is assured of meeting their KYC and AML requirements surrounding identification as it relates to physical site Location and existence.

A Food Chain drops their JOPAN coins at the doors of all their cafés to attract customers. The Food Chain, present in all major cities, issues a JOPAN "branded coin" on JOPAN's DWQHPL, taking advantage of its low cost, high throughput, and native Location and existence capabilities to promote Coffee by dropping their JOPAN Coins at the doors of every branch, a few times a day. The people who turn up collect the money and spend it in the stores or use them to purchase discounted coffee beans. The FOOD Chain has drawn more people to their Location and existence, has successfully promoted foot traffic, and has ensured uptake and trading of their JOPAN Coins.

Ricardo prevents speculators from manipulating his national currency. Ricardo is the Treasurer of a Nation. Trade within his economic zone is regulated with geo-fencing. The ledger handling currency exchanges recognize where the transaction was made, and trades made with outside communities are disincentivized. Ricardo protects his currency's value from speculators who are not physically vested and involved in our community.

Victor subsidizes his automobile fleet. Victor manages a fleet of automobiles on behalf of his corporation. He adds to the drivers' software a site Location and existence protocol witnessing layer. As the cars are used, the software contributes Location and existence witnessing validations to the system, and earn ciphercurrency just by driving, subsidizing the cost of the fleet.

Eva records her fitness record. Eva's insurance company gives Eva a discount if she makes her fitness routines visible to them. Using POEX cipherography, an immutable record of Eva's fitness is stored in her personal data store. The insurance company can gain assurance that Eva is meeting her weekly movement goals, without Eva revealing unnecessary details about her exact Location and existence .

Danny helps diffuse urban traffic. Danny's fleet of self-driving cars is routed via different parts of the city where strategically-placed JOPAN coins can be collected by his cars. While the new routes add 10-15 minutes to the drive, Danny's cars are compensated in JOPAN (or branded JOPAN Coins/Tokens) for having accepted modified routes that reduce traffic congestion.

Jayson is a farmer. He owns a rice field farmland that earns at least every 4months for planting rice. By using POEX JOPAN Coins. He can now maximize its earning potential by mining JOPAN Coins using POEX. He simply registers his Site/Location and existence Land Title and JOPAN will check and verify its authenticity and gather the land area to calculate using the land computation formula to came up with the total JOPAN Coins to be mined.

Land Owners/Governments with land titles and proof of Site/Land ownership. Based to the geo study Worldwide we have a total of Land area: 148.94 million sq km (57.506 million sq mi) while Coastline: 356,000 km (221,208 mi) this is the total mineable Site/Land area using JOPAN Coin or JOPAN Metaverse. Everyone that owns virtual land can now maximize the potential of their site/Location and existence /property.

Art and NFT Collectors. John is an Art/NFT Collector owning an Artwork or an NFT he has the power to activate the JOPAN Mining integration incorporated into the JOPAN Project. The Miner will get the Certification or Serial Numbers and it will solve mathematical calculations in the Blockchain to generate a new JOPAN Token and reward it to the first miner who solves it.

The JOPAN Foundation for Humanitarian Aid. The JOPAN Foundation is setting up a humanitarian task force to focus on airdropping JOPAN hybrid quantum cipher assets on needy communities and communities affected by natural disasters and catastrophic events such as war, economic collapse, earthquakes, famine, and others. **Characteristics**: Airdropping cipher assets to populations affected by catastrophic events; Real-time aid distributed directly to affected populations; Helping citizens and avoid inefficient aspects of government, NGOs, and endless red tape; Ensuring fair & even distribution; No waste: unclaimed coins revert back to donors; No hoarding - enforces throttling, rate limiting & per wallet limitations.

In fact, today's philanthropy overall is reduced because people suspect even large organizations not delivering all the value to the target community. JOPAN enables direct delivery to the people on the ground, disintermediating middlemen.

The law of unintended consequences means it will take time and experience to perfect disaster recovery coin drops. JOPAN intends to facilitate the community development of a set of best practices - for instance - people may be spread out at the time of a storm but then may cluster together at aid centers afterward. It does no good to leave most of the aid out in disaster areas that could incentivize people to return to unsafe areas (gas leaks, waterborne, diseases, etc.) before repairs/remediation and end any immediate danger.

Note : The JOPAN Foundation plans to partner with an international aid organization initially to experiment with the humanitarian air drops under their auspices.

What all these cases have in common is the use of a low-friction, high-assurance site Location, and existence credentials to advance a value proposition. And all use JOPAN or a JOPAN branded coin, on top of the JOPAN Protocol Decorum for Location and existence-based incentivization.

2.4 Economics

Users of the JOPAN protocol pay for their users using the JOPAN coin/token (JOPAN). In this way JOPAN behaves like other digital currency specially other cryptocurrencies or ciphercurrencies available, the leading open-source, public, DWQHPL -based distributed computing platform. JOPAN, measures how much "work" an action or set of actions takes to perform: for example, collecting a sensor fusion site Location and existence report may cost some fractions of a JOPAN. An operation on the JOPAN platform costs a certain number of JOPAN, with operations that require more computational resources costing more JOPAN than operations that require fewer computational resources.

> **Note:** JOPAN is a utility coin enabling incentivized Proof of Existence protocol operations. JOPAN holders have a right to access and drive usage of the platform by running in compatible codes (i.e., other cryptocurrencies and digital money), paying usage fees. The tokens may be used for payments and transactions relating to site Location and existence claims. JOPAN is not an investment vehicle.

2.5 The Decentralized Location and existence Market

JOPAN is the leading player in the Decentralized Site Location and existing services space. We are proud to share this space with some other companies or individuals engaged in similar services.

3 Location and existence Credentials

3.1 Location and existence Before JOPAN

A typical Location and existence credential, the kind done by most people's mobile phones several times a day to one's cellphone mobile network operator, Google search, and other service providers, looks like this:

device *d* is at Location and existence (*x,y*) at time *t*.

JOPAN treats Location and existence as one such verifiable credential, being a set of claims created by an issuer about a subject—a person, group, or thing—in a decentralized, privacy-preserving way that is supportive of self-sovereign identity and can be integrated into the typical web browser.

JOPAN's Proof of Existence protocol is compatible with the latest standards. JOPAN's continuing work ensures Secure Proof of Existence credentials will be available in people's everyday digital life, via their ordinary web browsers and phone apps.

JOPAN applies three strategies for enhancing privacy while Proof of Existence credentials are shared: data minimization, selective disclosure and progressive trust.

3.2.1 Data Minimization

Data minimization is a policy of minimum data collection and/or access for maximum value. Services using people's Location and existence data shall limit the amount of shared data strictly to the minimum necessary in order to successfully accomplish a task or goal.

Since data minimization is largely a policy decision, the fact that JOPAN relies on a shared hybrid public ledger greatly enhances its ability to promote data minimization and invoke it via community enforcement and transparency. JOPAN also supports minimization through organizational processes, documentation, and sample code.

3.2.2 Selective Disclosure

Selective disclosure is the ability of a JOPAN Wallet™ user to granularly decide what information to share. Selective disclosure is a means by which data minimization can be achieved. Data formats and cipherographic operations are harnessed throughout the system: to format the Location and existence claims, inspect those claims, and store them safely.

JOPAN Location and existence statements are constructed so as to ensure privacy as well as interoperability. They extend the technology behind TLS—the "green padlock" you see on your browser when you connect securely and privately with a company—with certain Zero Knowledge cipher graphics routines.

In the JOPAN Wallet, Public/Private key pairs are computed, with some other mathematical calculations required to curate the essential ingredients of the operations we are about to perform. The computational algorithm that will be used to validate the Location and existence information. A Location and existence claim is formatted, comprised of the public key and the proof of its correctness. A cipher graphics accumulator is constructed in order to enable zero knowledge queries further on. It is a one-way membership function, embedding the Location and existence data as part of a membership set. The operation can then answer a query as to whether a potential candidate is a member of a set without revealing the individual members of the set.

In the Hybrid Public Ledger or the Blockchain, a JOPAN Quantum Algorithm is executed, and the relevant public keys are aggregated for use in validating the signatures. It also commits to some given value while keeping it temporarily hidden, making the calculation binding. It can then verify the proof of correctness and record the result on the Hybrid Public Log.

By following this process, JOPAN and other services in the Site Location and existence Credentials community can leverage Location and existence information for more and more value, while still preserving privacy.

3.2.3 Progressive Trust

Progressive trust is the ability of an individual to gradually increase the amount of relevant site Location and existence data revealed as trust is built or value generated. As trust grows, an individual may choose to share more and more site Location and existence data; conversely, if trust is eroded, a person can shut down access to their site Location and existence information.

Trust scores enable progressive trust in the JOPAN platform. Handled in ways similar to Location and existence credentials, trust scores are specialized credential that represents the trust relationship between parties, between a given JOPAN Wallet. Machine evaluation of trust scores enables the platform to support both increasing trust, where two entities may increase the amount of shared information between them, or decreasing trust, where for some reason trust has been lost and a party is deprecated in its ability to vouch for certain proofs.

3.3 JOPAN Public Maps and Privacy

Site Location and existence information is gathered and stored by many commercial and governmental services under a wide variety of databases, terms, licenses, and trust chains. Other services such as search engines generate their own databases that mirror internet content with enriching contextual information added. Mapping services work alongside to fulfill the critical function of visualizing correlations between data sets. Often this geographic or geospatial information (GI) are locked into storage tower and are difficult to access. Some charge fees while others are monetized by the mining and sharing of people's personal data. Still others are operated by oppressive regimes or are used by attackers to cause harm.

JOPAN is aware that its information will be discovered and accessed by these services, so JOPAN implements ongoing procedures to ensure that abuses do not creep in, and users are protected while enabling transparency. This section details some of those procedures and methods.

> **Note** JOPAN is guided by its work with System Engineers and Architects Group, and was founded by longtime advocates for individual privacy rights and data sovereignty. We work closely with the relevant thought leaders on the process of sharing Location and existence credentials and information with proper consent and preservation of dignity.

JOPAN is stackable and stake able protocol that operates within the GI ecosystem and so interacts with these GI services. The JOPAN smart contracts are written with this ecosystem in mind. Its Protocol can use and contribute to open data tracking of Wi-Fi access points, cell towers, Bluetooth ideals, and other publicly known sources that contribute to sensor fusions.

Location and existence services such as JOPAN must deal with the implications of affecting actual human movement. Since JOPAN's use cases such as coin drops and "Pokemon Go" style competitions have this impact, JOPAN builds-in safety features to mitigate the possibility of accidents. These include rate limiting, the ability to limit the rate at which a set of policies can be fulfilled; density limits, limiting the amount of JOPAN digital assets within a particular area density; place information to assist developers in knowing what types of human activity occur in that place (e.g., is it a private field, an urban area, or the middle of a lake); monitoring of the platform for hazards, and so on.

In the end, JOPAN implements ongoing oversight and transparency to ensure that Location and existence harms do not creep in, and instead best practices continue to spread in the GI space.

3.4 Calling the JOPAN Protocol

To request and consume secure Location and existence credentials in your application, call the JOPAN API. The API is broken out into easy-to-understand API calls that simplify working with JOPAN's secure Location and existence credentials.

Some features of the API include:

The query for Location and existence information on a variety of categories for up-to-date information about a given location and existence such as coin drops on that Location and existence and their status (completed, in progress), secure beacons in the area, attesting witnesses in the area.

Setting and querying information relevant to the Location and existence claim, such as Location and existence, radius and time of availability.

Integration of place identifiers, to enable cross-communication with other geospatial APIs.

Queries for various JOPAN Policy properties, such as the cost of the call, and security assurance level.

Protocol API calls function as any other activity on the JOPAN Platform, and have to be paid for in JOPAN to complete properly.

4 Decentralized Ledger

4.1.1 Immutable Hybrid Public Ledger

The following are the primary aspects of Binance Smart Chain (BSC) that determined JOPAN's selection of BSC as the host of JOPAN's main ledger and blockchain.

Robust; scale

Developer-friendly.

Conversion and trading tools

Good consensus

Immutable

Reliable: Good testnet. proven track record. Won't dry up and disappear.

High participation rates = good security.

4.1.4 Semantics and Security

The JOPAN ecosystem thrives on community participation in writing JOPAN Algorithms, which in turn run on secure encrypted computational engines. To ensure the health of this environment, JOPAN's software semantics have security and privacy by design and enforce opinionated best practices.

JOPAN builds in the lessons to date regarding static analysis of Location and existence-oriented software as well as broader pitfalls in logic and purpose. In addition to the basics of missing input validation, reentrancy avoidance, integer value limits, and loop length limits, JOPAN's semantics prevent security vulnerabilities and bad practices by protecting developers regarding:

Transaction ordering dependence. The system validates dependence and warns developers of possible poor dependencies.

Timestamp inconsistencies. The system uses secure time and makes clear to the developer how latencies in processing could be windows for attack

Call-stack depth. In general, we work to reduce cyclomatic complexity, being the number of linearly independent paths through a program's source code.

Examine the "unhappy" cases and exception handling, example using "send" or

"transfer" instead of the pull payments pattern.

Include dynamic parts in the code, so these cannot be swapped out in future versions.

4.2 JOPAN Wallet™

The JOPAN Wallet™ app runs on smartphones and provides a simple user interface and experience (UI/UX) to mediate the interaction. As with all aspects of JOPAN, the app is built and deployed with security and privacy by design.

Users operate or own nodes, but it is technically the nodes that earn the money. Nodes earn JOPAN coins by providing witnessing and attestations to Location and existence claims. There are several types of nodes: Pocket (mobile), full node, and secure trusted beacon node.

5 Verifier Address

The Verifier allocates a unique address and associated state machine for each JOPAN Process. This machine then functions as a channel, much as payment channels and side channels function on other blockchains. The channel is bookended by a pair of significant transactions. The first is the anchor transaction, which serves as an anchor for the entire activity and inaugurates the

machine. The final one is a settlement transaction, which publishes the channel's outputs and closes it out.

To understand a channel, let's examine the trivial case of the uninspected Location and existence claim, "I am at Location and existence X,Y." The unverified claim has no witnesses, no security validations, or any security at all—it is what it is. The channel is initiated with its anchor configuration, key material, and algorithms. The uninspected claim is received. The settlement process then formats the claim for privacy-preserving publication, publishes it, and destroys the channel.

Channels are the heart of the JOPAN ecosystem and we expect them to do much, much more. The power of the Verifier and its open architecture really shines when you add the Hybrid Algorithms or HALs.

5.1 HALs: Hybrid ALgorithms

A platform is only as useful as the applications that run on it: like the apps that run on your smartphone, HALs are hybrid algorithms: lightweight software components that run in the Verifier and/or on a mobile phone. They can do anything from collecting a QR code via a smartphone camera to requesting audio witness signals from nearby JOPAN Wallet owners. The HAL store makes available all HALs with information about their provenance and popularity, and HALs can be combined in a channel in endless ways.

Some examples of HALs include:

Checking hashes,

Collecting secure beacon messages from near the client

AI inspection of behavior over time

Collecting audio near-supersonic signals

Multisig and time controls.

HALs enable speed, extensibility, flexibility, and moveable security. They are implemented in a transparent way, with secure boot signatures to prevent tampering.

5.2 Trusted, Private Computing

The Verifier assures privacy-preserving computation and decentralized (aka trustless) operation by running its state machines in confidential enclaves. It achieves this goal by being secure by design and privacy by design from the processor up to the application layer. The Verifier offers transparent data encryption, key management and secure compute features ensuring that each channel is working only with its creators and users—the verifier sysadmins only see the existence and bare facts about the channel, and cannot access the channel's exact activity, even if under orders. This is achieved by creating a secure application layer encrypted connection from the HAL (Hybrid Algorithm) participants directly to the protected channel in the Verifier. The authorization for trusted connectivity is managed using the same cipher graphic keys anchoring the JOPAN wallets. Connectivity between nodes is protected.

This ensures that each device involved in the JOPAN protocol is indeed in the hands of its rightful owner and making honest claims, without revealing anything about the owner, their history, Location, and existence or other sensitive data.

The Verifier performs like an internal confidential application from a performance and connectivity aspect. Its secure computing model allows the strict partitioning and role-based access that is a standard feature of secure data centers.

6 Incentivizations

The application of incentives to JOPAN's Proof of Existence protocol on the blockchain is one of the insights that founded JOPAN, and is based on game theory models that are working in other cryptocurrencies. They both *encourage* actors to nurture JOPAN's strong, safe, peer-to-peer operation and *discourage* bad actors by punishing those who act maliciously.

> **Note:** Incentives discussed here refer to Location and existence validation and witnessing. Consensus on adding chunks to the JOPAN Plexus is not in the scope of this chapter. See the chapter on the decentralized ledger for more on that.

JOPAN's fungible utility coin, the JOPAN, with its **smallest unit 0.00000001 or 1 JOP**, is the primary continuously operating incentive unit on JOPAN's DWQHPL. JOPAN is fungible, meaning it can be exchanged for other digital currencies, empowering it to incentivize and mold the behavior of platform participants. Varying amounts are rewarded to nodes that run JOPAN Policies (with their associated HALs) of varying complexity. A simple policy pays minimal fees. An elaborate policy, such as one requiring AI-powered Location and existence history analysis or zero knowledge credentials, rewards higher fees. Baking these fees into JOPAN's consensus and incentive structures ensures that the JOPAN ledger does not become bogged down with low value, high bandwidth work, or malicious attempts to create artificial bottlenecks. JOPAN allows arbitrarily complex Location and existence validations to be processed, so it is important to measure the work done directly instead of just choosing a fee based on the length of the policy being processed.

Nodes can earn JOPAN or JOP by participating in attestation and secure Location and existence witnessing. Secure beacons, whether standalone or integrated into devices, can continuously earn JOPAN over time. The rate of earning correlates with the number of JOPAN policies that request validation from that beacon so beacons in busier, more populated, areas have the potential to perform witnessing more frequently and, as a result, earn more JOPAN. Secure beacon HALs can share analytics, enabling participating businesses to project revenue as an example *"How much can a vehicle in my fleet earn as it drives around a metropolitan neighborhood running a secure beacon?"* These models will be shared as they mature.

JOPAN pricing can also enforce disincentives. For example, creating overly aggressive policies that hoard Location and existence proofs will be made to cost more JOPAN.

Preventing large swings in JOPAN coin price and maintaining the cost-effectiveness of everyday transactions is achieved by protections similar to other currency price adjustments. These transparent, robust, and adjustable mechanisms rest on the three main approaches to token stability:

Static price fallbacks: a fallback price since static pricing changes relatively slowly

Price indexing: An index based on a gross moving average

Real-time demand pricing: market forces dictating how much people are willing to pay and how much nodes are requesting.

6.1 Incentive Prices

Just as the JOP and the Satoshi are the smallest units of a JOPAN and a BTC, respectively, JOP is the smallest indivisible unit of a JOPAN. The JOPAN JOP is also an acronym describing the function of the JOP within the JOPAN incentive mechanism: the *JOPAN Linked Stimulus*.

Note: JOPAN is a utility coin enabling incentivized Proof of Existence operations. JOPAN holders have a right to access and drive usage of located digital assets on the platform by running:

JOPAN's *Firmness Geo* in EVM-compatible code and paying transaction fees in JOPAN. The tokens may be used for payments and transactions relating to site Location and existence claims. JOPAN is not an investment vehicle.

To better understand the structure of the PTN: a single PTN token is divisible into one billionth, or ten decimal places, as follows:

`0.0000000001 JOPAN = 1 JOP`

`1 JOPAN = 1,000,000,000 JOPs`

JOPAN's incentive model is based on nodes running the JOPAN Wallet™, providing witnessing to surrounding Locations and existence claims within proximity. Depending on the complexity of the transaction and policy, each transaction on the JOPAN blockchain may include a different gas price, which is paid to miners, validators and participating witnesses.

7 Secure Verification of Location and Existence Claims

One of the key mechanisms that underpin the security of JOPAN is the secure verification of Location and existence claims. JOPAN supports a wide range of localization techniques and takes a pragmatic approach to Location and existence verification – it, therefore, provides a good tradeoff between user effort, service availability, and security.

JOPAN relies on sensor fusion on the mobile device, user's behavior over time, and peer-to-peer observations. In addition, JOPAN leverages trusted anchors to increase confidence in asserted Location and existence claims.

One of the core strengths of JOPAN is the **diversity of sensing modalities and witnesses**, and their **smart aggregation** that will make it challenging and costly for adversaries to successfully claim fake Locations and existences. In addition, JOPAN rewards honest behavior, therefore disincentivizing cheating. JOPAN does not rely on a single technology but on a range of sensing, communication, and positioning technologies.

7.1 The Three Pillars

The three pillars of security in JOPAN are as follows:

7.1.1 Sensor Fusion

JOPAN makes use of on-device Location and existence-relevant sensors such as (e.g., GPS, Galileo), Bluetooth, accelerometers, Wi-Fi, and cellular-network observations. Both Android and iOS allow for these sensors to be combined in different ways and provide sufficient precision. JOPAN combines different sensors' values in a robust manner to counter simple spoofing attacks. It will further, where available, use trusted computing technologies such as ARM Trust Zone [TZ] and Intel SGX [SGX] to protect Location and existence reporting from on-device manipulations. A dedicated user can still jailbreak the platform and spoof the measurements, as well as spoof the WiFi and cellular signals that the platform receives. Such spoofing, although feasible, comes at a cost for the user. The user needs to relay cellular signals, generate signals and emulate Wi-Fi access point MAC addresses, as well as make all these signals mutually consistent. Such an effort would be justifiable only if the reward is high.

In order to thwart these spoofing attacks, JOPAN will analyze consistency among sensed values, and user behavior over time and use peer-to-peer witnessing.

7.1.2 Behavior Over Time

JOPAN will track Proof of Location and existence over short time windows and user behavior over longer periods of time. Short-time observations will allow JOPAN to implement anomaly detection techniques and evaluate the validity of Location and existence claims. JOPAN will also peer into users' overall behavior over time, including their location and existence and prior coin claims, and use these to build up users' reputation scores. All this will be done securely and in a highly privacy-preserving manner that protects users' identities. These scores will increase when users behave honestly and decrease when suspicious activity is identified. To incentivize honest behavior, high scores will be rewarded.

Verifier and/or on a mobile phone. They can do anything from collecting a QR code via a smartphone camera to requesting audio witness signals from nearby JOPAN Wallet owners. The HALs store makes available all HALs with information about their provenance and popularity, and HALs can be combined in a channel in endless ways.

Some examples of HALs include:

Checking hashes,

Collecting secure beacon messages from near the client

AI inspection of behavior over time

Collecting audio near-supersonic signals

Multisig and time controls.

HALs enable speed, extensibility, flexibility, and moveable security. They are implemented in a transparent way, with secure boot signatures to prevent tampering.

7.1.3 Trusted, Private Computing

The Verifier assures privacy-preserving computation and decentralized (aka trustless) operation by running its state machines in confidential enclaves. It achieves this goal by being security by design and privacy by design from the processor up to the application layer. The Verifier offers transparent data encryption, key management and secures compute features ensuring that each channel is working only with its creators and users—the verifier system admins only see the existence and bare facts about the channel, and cannot access the channel's exact activity, even if under orders. This is achieved by creating a secure application layer encrypted connection from the HAL (Hybrid Algorithm) participants directly to the protected channel in the Verifier. The authorization for trusted connectivity is managed using the same cipher graphics keys anchoring the JOPAN wallets. Connectivity between nodes is protected.

This ensures that each device involved in the JOPAN protocol is indeed in the hands of its rightful owner and making honest claims, without revealing anything about the owner, their history, Location, and existence or other sensitive data.

The Verifier performs like an internal confidential application from a performance and connectivity aspect. Its secure computing model allows the strict partitioning and role-based access that is a standard feature of secure data centers.

Peer-to-Peer Witnessing - Users will be able to act as witnesses for each other's Location and existence s through the use of short-range communication techniques such as Bluetooth, WiFi, ultrasound and camera. JOPAN envisions that most of this interaction happens without any user involvement. JOPAN relies primarily on Bluetooth beaconing mechanisms, but will integrate any new types of proximity detection technologies that become available. Some witnessing will be more interactive and involve user interaction (e.g., the use of QR codes). Users' efforts in verifying other's site Location and existence claims will be rewarded.

8 Incentivizations

The application of incentives to JOPAN's Proof of Existence protocol on the blockchain is one of the insights that founded JOPAN, and is based on game theory models that are working in other cryptocurrencies. They both *encourage* actors to nurture JOPAN's strong, safe, peer-to-peer operation and *discourage* bad actors by punishing those who act maliciously.

> **Note** Incentives discussed here refer to Location and Existence validation and witnessing. Consensus on adding chunks to the JOPAN Plexus is not in the scope of this chapter. See the chapter on the decentralized ledger for more on that.

JOPAN's fungible utility coin, the JOPAN, with its smallest unit JOP, is the primary continuously operating incentive unit on JOPAN's DWQHPL. JOPAN is fungible, meaning it can be exchanged for other digital currencies, empowering it to incentivize and mold the behavior of platform participants. Varying amounts are rewarded to nodes that run JOPAN Policies (with their associated HALs) of varying complexity. A simple policy pays minimal fees. An elaborate policy, such as one requiring AI-powered Location and existence history analysis or zero knowledge credentials, rewards higher fees. Baking these fees into JOPAN's consensus and incentive structures ensures that the JOPAN ledger does not become bogged down with low value, high bandwidth work, or malicious attempts to create artificial bottlenecks. JOPAN allows arbitrarily complex Location and existence validations to be processed, so it is important to measure the work done directly instead of just choosing a fee based on the length of the policy being processed.

Nodes can earn JOPAN or JOPs by participating in attestation and secure Location and existence witnessing. Secure beacons, whether standalone or integrated into devices, can continuously earn JOPAN over time. The rate of earning correlates with the number of JOPAN policies that request validation from that beacon so beacons in busier, more populated, areas have the potential to perform witnessing more frequently and, as a result, earn more JOPAN. Secure beacon HALs can share analytics, enabling participating businesses to project revenue for example *"How much can a vehicle in my fleet earn as it drives around a metropolitan neighborhood running a secure beacon?"* These models will be shared as they mature.

JOPAN pricing can also enforce disincentives. For example, creating overly aggressive policies that hoard Location and Existence proofs will be made to cost more JOPAN.

Preventing large swings in JOPAN coin price and maintaining the cost-effectiveness of everyday transactions is achieved by protections similar to other currency price adjustments. These transparent, robust, and adjustable mechanisms rest on the three main approaches to token stability:

Static price fallbacks: a fallback price since static pricing changes relatively slowly

Price indexing: An index based on a gross moving average

Real-time demand pricing: market forces dictating how much people are willing to pay and how much nodes are requesting

8.1 Proof of Existence

Proof-of-Existence (PoEx) - To implement a distributed unique timestamp server on a peer-to-peer basis, we will need to use a Proof-of-Existence system also called SITE LOCATION AND EXISTENCE PACKETS or PROOF OF SITE EXISTENCE PACKETS, rather than newspaper or Usenet posts. The Proof-of-Existence involve scanning for a value that when hashed, the hash begins with a number of zero with 8 decimal places with additional decimal places for micro decimal counting from the whole number. The average work required is exponential in the number of zero bits required and can be verified by executing a single hash. JOPAN was initially created to have a Proof-of- Existence Phase for tts available blocks. With Proof-of-Existence, a 5% under cropping mode rate quarterly is being applied meaning the JOPAN Space in a certain wallet will execute a flopping JOPAN at a rate of 5% per quarter based on how many JOPAN vvalueson that time. In Proof-of-Existence, Age means users don't have to mint or have their wallets connected to the Internet. For our timestamp network, we implement the Proof-of-Existence by incrementing a nonce in the block until a value is found that gives the block's hash the required mined coin. Once the Site Location and existence calculations and encryption effort have been expended to make it satisfy the Proof-of-Existence, the block cannot be changed without redoing the work. As later blocks are chained after it, the work to change the block would include redoing all the chunks after it. The Proof-of-Existence also solve the problem of determining representation in majority decision-making. If the majority were based on one-IP-address-one-vote, it could be subverted by anyone able to allocate many IPs. Proof-of-Existence is essentially one-SITE LOCATION AND EXISTENCE-one-vote. Usually, this is calculated by 10,000 schemes per vote. The majority decision is represented by the longest cipher chain, which has the greatest Proof-of-Existence effort invested in it. If most of the SITE LOCATION AND EXISTENCE power is controlled by honest secured unique nodes, the honest chain will grow the fastest and outpace any competing chains. To modify past chunks of minting, an attacker would have to redo the Proof-of-Existence of the block and all blocks after it and then catch up with and surpass the work of the honest nodes then the secret codes will takes place to secure everything and give the right coin reward to the right owner of the free space. Network and How it Works: Nodes always consider the longest chain to be the correct one and will keep working on extending it. If two nodes broadcast different versions of the next block simultaneously, some nodes may receive one or the other first. In that case, they work on the first one they received, but save the other branch in case it becomes longer. The tie will be broken when the next Proof-of-Existence is found and one branch becomes longer;

a.) Downloading or synching JOPAN unique history deep web public journal ledger from its own Cipher Chaining technology.

b.) An available public program will be provided and must read the Public Journal Ledger for the synching to complete. Each node collects old to new transactions into a block.

c.) Writing a plotting scheme frame to the Site Location and existence available.

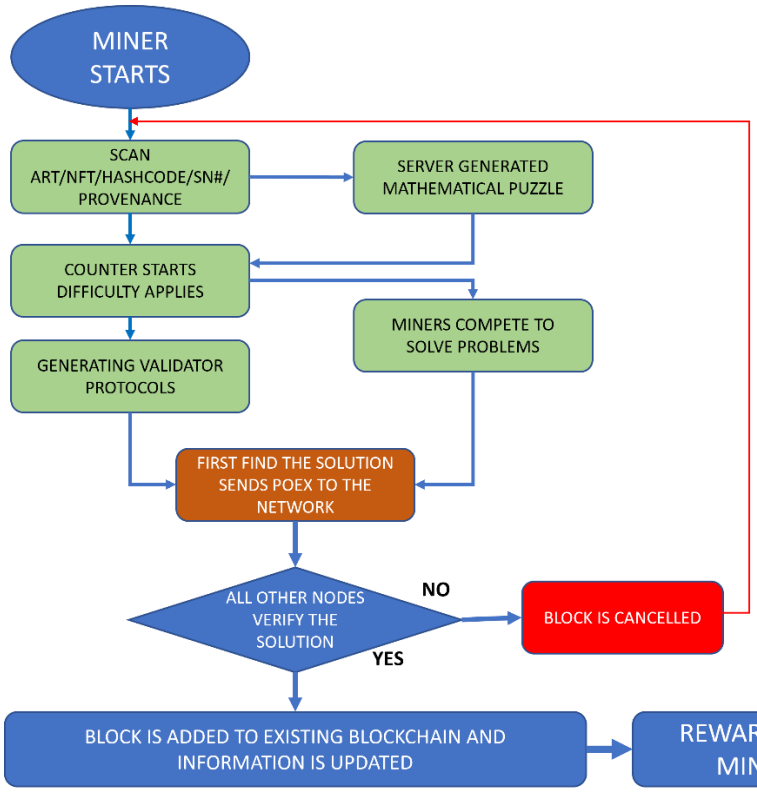
d.) After calculating site Location and existence plots (The miner can start mining)

d.1.)Execute Miner Command Prompt

d.2.)Miner will find the right timing to input the generated codes in the journal ledger. Depends on the difficulty. (Difficulty increases every 3 months at 12% - quarterly - making it more friendly for minters)

d.3.)Reward will be given to the miner/minter once successfully input the plot codes to the Journal Ledger. (Rotation of cipher chain takes place making every minter to wait for their turn to input their own timestamp in the Journal Ledger.

d.4.) The miner/minter will put an encrypted mark seal on the Journal Ledger of its completed task, mine, coin, or reward. e.) Successful possession of the minted coin to the space owner will be credited to their respective wallet or exchange portal.



PROOF OF EXISTENCE (PoEx) Consensus Protocol

9 Conclusion

What we do with our site Location and existence information is deeply shaped by the format of the PoEx. Your site Location and existence are known to the people around you, but they only see your physical presence and may not know your name. Your phone's Location and existence are known to your mobile telephone network operator, but you cannot share this, say, with your insurer, even if you wished to. When your friend wants to know where you are, you have a whole set of expectations that differ when your bank, your insurer, your search engine, your browser, your delivery service, your doctor, your lawyer, or your mother wants to know where you are: Your cellphone provider knows where you are, your package delivery service knows where you are, your cleaning lady knows where you are, your mother knows where you are, and on and on. Each brings about in you a different set of desires as to whether you wish to share your Location and existence or not.

JOPAN enables a new way of sharing Location and existence information. You decide whom to share it with, and how. Privacy-preserving easy-to-use HALs lock up your information with cipherography so that your information only does what you wish it to do. And you can earn money for participating in the system. Such

a privacy-preserving Location and existence protocol is a game-changer. Yesterday, site Location and existence claims were made separately, insecurely, without one claim being able to be used with another.

9.1 Statement of Facts

JOPAN is a utility Hybrid Art, Cipher Coin and Cryptocurrency.

JOPAN has Tokenomics mainly Marketing 3%, Liquidity Pool 5%, and Reflection Rewards 2%.

JOPAN has NFTs and Metaverse Connections

JOPAN has its Mining Integration Functions for PoEx Consensus Algorithm

JOPAN as branding for Products or Services

9.2 Next Steps

Site Location and existence Credentials and Proof of Existence unleash efficiencies of scale and new economics and value based on sharing resources better, more effectively, and with more granular control. This is the dawn of the site Location and existing marketplace. It is powered by JOPAN. Start using JOPAN, get involved.