# NUGENESIS

**PART B          TECHNICAL OVERVIEW**

# DESIGN FOR CONTINUOUS TECHNICAL INNOVATION THROUGH MAINSTREAM ADOPTION AND THE METAVERSE

## B1.    Design Principles

B1.1    NuGenesis is a network of parallel processing blockchain systems.  We use multiple chains with multiple interoperable languages, processing in parallel, that we believe is essential for mass adoption in the transition from the internet to the metaverse.

B1.2    In the context of working with Governments in regard to the introduction of CBDCs, NuGenesis' paramount concern was for unlimited saleability, instantaneous transaction speeds, high efficiency with zero emissions that would foster the mass adoption of crypto assets for the creation, recognition, and exchange of value.

B1.3    The mass adoption of blockchain technology, NuGenesis considers, is occurring in a dynamically evolving environment, where global interaction is set to be shifting from the internet to the metaverse.  That is, where augmented and virtual reality will be interacting with each other and increasing replace the internet.  In this environment, transactions in the billions per second will be required.  The current state of blockchain innovation does not accommodate the requirements of the metaverse.  With NuGenesis' background, we believe our quantum leap in speed and scalability creates the capacity for the development of the blockchain for the metaverse.

B1.4    The design philosophy is the creation of a layer 1 network of multi-language cross chains, parallel processing, that provide true interoperability to harness and synergise existing expertise, and, propel new modes of collaborative innovation.  Our focus was therefore on building the broader infrastructure needs to cultivate mass adoption of blockchain technology, so that:

(a)  a community of developers and projects can enter to seize the opportunity provided by NuGenesis infrastructure to propel innovation to exploit it; and,

(b)  NuGenesis focuses on continuous technical innovation to that broader infrastructure to harness the opportunity that mainstream adoption of crypto technology offers for the developing community to continue to exploit.

Our approach means that rather than being problem solution specific, we are problem solution general.  We focus on the broader rails for others to bring incremental innovation.  That is, we seek to maintain the best conditions for 3rd parties to become developers to exploit the opportunities the infrastructure provides.  For example, Smart Contract Digital Notarised Contracts™ (DNC's), serialisation of coin creation for the development of next generation financial instruments.  Whilst developers are building their dApps, NuGenesis will continue to evolve the platform to meet the challenges of the decades ahead.

For example, continuing our work into implementing:

(a) 'quantum resistance';

(b) 'zero knowledge proof' technology that maximises data privacy and personal sovereignty without compromising the legal needs for the integrity of actors;

(c) Off-line processing with satellite technology for those parts of the globe that are not reliably on-line; and,

(d) Transition into complete virtual reality where global interaction is beyond the keyboard, beyond messaging texts, videos and numbers to a virtual interaction where play, economic and social life are effected through avatars in our 'parallel worlds'. This virtual reality realm will of course, interact with other virtual reality realms in the metaverse and will continually replace the internet as form of interaction.

B1.3 NuGenesis' philosophy is that duplicative competition and information silos in the crypto industry shood be avoided. Instead, we favour harnessing the synergy from the composability that the benefits of tested iteration of tech are continually innovated upon to meet the imperatives that the crypto revolution offers to humanity.

B1.4 Effecting the design philosophy involves implementing the cornerstone interdependent priorities of:

(a) achieving unlimited scaling capacity. Indeed, instead NuGenesis has adopted the principle that the more users, the faster the transaction speed;

(b) achieving parallel processing of unlimited amounts of data in the order of millions of transactions per second, through simply adding the parallel processing power to meet anticipated requirements - without any sacrificing data which we consider valuable in and of itself;

(c) establishing a mechanism for continual innovation of the infrastructure, not only through the on-going upgrades and development for future needs, but ensuring the platform funds that continual innovation as an encoded principle in the governance protocol of the blockchain;

(d) achieving true interoperability of blockchain protocols through cross chains and hyper bridges able to communicate with different languages;

(e) effecting interoperability by parallel networks running as independent sovereign blockchains that do not burden the resources of each other; and,

(f) provide, through a fully-fledged exchange protocol which is answerable to the market, the opportunity for funding to flow to the best tech, rather than having tech development influenced by the needs to access capital.

B1.5 The broader infrastructure of our ecosystem includes legal arrangements with Co-operating Countries establishing Special Digital Economic Zones that provide supporting regulatory regimes for the recognition of Crypto assets and their use; an administrative infrastructure and accreditation. These are discussed in Part C. This Part, deals with the tech.

## B2.    The multi-chain, cross chain network

B2.1    The NuGenesis blockchain network is a multi cross-chain ecosystem that uses 6-29 languages interoperably.    The main chains are:

(a)  the NuGenesis main blockchain that is built on Substrate;

(b)  the 2$^{nd}$, 3$^{rd}$ and 4$^{th}$ Generation innovations beyond the Substrate framework that use the Link language rather than Solidity to support the additional features on the NuGenesis Smart Chain™ and NuGenesis Smart Chain II, which include:

   (i)   Smart Contract Digital Notarised Contracts™ (DNCs)
   (ii)  Non-Fungible Tokens (NFTs)
   (iii) the multi-coin creation capability on the Smart Chain;

(c)  the LedgerX (Exchange) Trade chain that is based on C++ that is a parallel processing chain made of a tri blockchain configuration;

(d)  the Ethereum Chain;

(e)  the Bitcoin Chain;

(f)  the Ethereum Voting Chain ("EVC");

(g)  BitCoin NU; and,

(h)  BitCoin GREEN (being a Proof of Authority version of bitcoin).


B2.2    Any dApps built on Ether for example can be interoperable within the NuGenesis network. The 3,000 dApps and ecosystem built on Ethereum for example can work on NuGenesis and settle on the Ledger X exchange chain.  The goal is that the innovations and benefits of iteration that has occurred over the last decade, can be fully interoperable with NuGenesis.

B2.3    Through multiple blockchains we can also have a chain operate as an intermediate blockchain if, for some unforeseeable reason that may arise, we cannot connect to the right one directly in the interim.

B2.4    Currently being completed are the hyper-bridges necessary to bring another 29 blockchains project chains within our interoperable network.

B2.5    NuGenesis blockchain can meet the scaling needs of any enterprise.  It can be customised by any project cheaply and easily and bridged to the ecosphere as a parallel network.   Those that do not require an independent sovereign blockchain (and the costs associated with establishing and maintaining it) can instead opt to use a para chain slot within the NuGenesis blockchain network system.  Those projects desiring immediate, affordable and low cost entry can create Coins and tokens on the NuGenesis Smart Chains on both Layer 1 and 2.

**B3.    The NuGenesis main chain**

B3.1    The NuGenesis main chain(s) are built on a combination of frameworks, one being the Substrate Blockchain builder framework.  Substrate was specifically chosen so that the issue of interoperability is standard feature.  Binance, Polkadot and Cosmos are likewise built on Substrate.  The NuGenesis chain upgrades as the Substrate framework upgrades and hence benefits from the extra functionally continually introduced thereby.

B3.2    As will be discussed below as to how we achieve unlimited scalability; we have chosen a 3 second block finality as the standard being the most efficient speed.  The speed can be readily reduced to 200 millisecond block finality.

B3.3    Whilst the EVM Pallet was an attractive feature of Substrate to maximise the interoperability and allow "cut and paste" from dApp developers into the NuGenesis ecosystem, we have also developed features that required, for the NuGenesis Smart Chain II, a more powerful language than solidity.  These 3$^{rd}$ and 4$^{th}$ Generation features are built in both solidity for Smart Chain I, and in the Link Language in Smart Chain II, in order to allow for their on-going innovation in the later.  We believe that the on-going innovations on the road to the metaverse are beyond the capability of the Solidity language and require the power of Link.

B3.4    NuGenesis uses system validators and the system is given added integrity by a layer of AI monitoring the validator nodes to avoid corruption.  Optimal efficiency with excess capacity has been achieved with 4 validators nodes that are super nodes and 1 simple or authority node.  The network topology, P2P, uses the Aura round robin protocol to ensure randomisation between validators and integrity of the block.

B3.5    There two consensus mechanisms:

(a)    Proof of Authority with useful work AI (Artificial Intelligence); and,

(b)    Grandpa, being substrate functionality to ensure block transactions are valid and the longest chain is the best chain.

We discuss the validation process below in terms of achieving scalability by removing the validation process.

B3.6    Each block can store 5mb of data, even though we typically use only 2KB.  Currently, the system achieves optimality with 5M data blocks. The capacity is necessary for achieving larger numbers and size of transactions, and for the file size to account for video, data streaming etc which involved with Smart Contract Digital Notarised Contracts™ ('DNC's) and Serialised Notarised Digital Assets (SNDA's) (broadly comparable to NFTs).  This should be contrasted with 54Mb and less than 1 Mb for Ethereum and Bitcoin respectively.

B3.7    Once validated, the transaction becomes timestamped and part of the blockchain.  NuGenesis currently uses SHA 256.  It can go to SHA 512, but SHA 256 is optimal.

## Achieving unlimited scalability

B3.5   The constraints to scalability are:

(a)   data flow management to ensure enough data flows into the block within the finality time to seal the block;

(b)   the block size;

(c)   the block speed;

(d)   the bottleneck caused by the consensus mechanism; and,

(e)   security and system integrity

## Resolving the validation bottleneck

B3.6   The NuGenesis chains can run at 200 milliseconds, but are currently run at 3 second block finality to maximise the block height at zero fault tolerance.  This will be relevant below at para [B 7.1] where our solution to maximising the data flowing into the block is discussed.

B3.7   Bottlenecks are created by the consensus mechanism.  Proof of Work slowness is notorious and need not be repeated here.  Even Ethereum 2, because it will be using people node validators will require communications between them, including fee auctions etc that creates at least a 4-17 second delay before reaching the point of going into the block and hence will continue suffering bottlenecks in the validation process.

B3.8   Solutions for mitigating bottlenecks in order to scale include 'processing data before packing', which we use in the Ledger X blockchain, and sharding.  Sharding has problems for commercial enterprises because all the relevant data for that enterprise is no longer retained in the same system.  It is split into different shards and cannot be merged.  Each shared blockchain is its own independent body and with it also the inherent problem of duplication.

B3.9   Whatever the language used, pre-processing extrinsics (events, signed or unsigned transactions) by time ordering and verifying transactions at the event speed tends to have a more theoretical than real increase in the speed of transactions.  These solutions tend to come at the cost of data retention.  Any solution that seeks to limit the amount of data is not acceptable to us because we believe that data is valuable and will increasingly be so.

B3.10  In the Ledger X chain which is primarily to payment settlements, including through our off-chain payment card, settlement is instant using the liquidity pools before updating the blockchain ledger.

B3.11  On the NuGenesis main chain, we used system validators comprising the 4 super nodes and 1 authority node which is a simple node.  The authority (non-validator) node keeps the blockchain data.  It can be transacted upon but cannot make a block.  It runs the explorer, data analytics and outputs data generally, designed to keep these activities from putting pressure on the validator nodes.

B3.12   The system validator nodes run on the randomness of the round robin protocol and are monitored by AI, achieving transaction speeds in the milliseconds. There are no requests from 1000's of validators and fee actions. The streamlined validation process through the super nodes with byzantine fault tolerance and randomness via round robin monitored by AI, makes unnecessarily superfluous the broadcasting through validation networks. We have found that 4 super node validators is an optimal spec efficiency to be an enterprise solution for any of the worlds current global corporations.

B3.13   The simple node is included in order to be able to add more nodes to the network and to connect with other blockchains. When a project becomes a parallel network, a simple node will be configured to it giving full ledger data access (without validation capability).

**Dual Artificial Intelligence ("AI") system integrity and security**

B3.14   The NuGenesis system uses two AI's for system integrity and security:

(a) our internal AI, **NAVIS** - NuGenesis Artificial Verification Intelligence system that conducts numerous functions in the ecosphere. One of NAVIS's primary functions is to ensure the integrity of the validator nodes. (NAVIS has other functions, including monitoring suspicious account activity and anti-whale manipulation of NuCoin price);

(b) an external, independent, service provider, REACTOR, who's AI is security focused to prevent external attacks such as hacks and malware.

B3.15   Of course we have over 52 penetration teams continually testing the robustness of the NuGenesis security.

## B4. Parallel Processing scalability solution

B4.1 Instead of sharding and having different data in different shards, NuGenesis uses parallel processing (patent pending). Instead of having a shard that has one data set, NuGenesis has a whole chain for a data set, implementing dedicated chains for:

(a) ordinary Coin Creation;
(b) serialised Coin Creation;
(c) smart contracts/DNCs; and,
(d) serialised Notarised Digital Assets ('SNDA's)/NFTs

B4.2 As these chains are developed, they will have different optimal block finalisation speeds whose optimal efficiency may vary from higher speeds of 200mil/secs for coins to slower, 6 secs for DNCs. The importance for scaling purposes is that by keeping the specialised chains separate, there is no pressure to slow the network.

B4.3 With the implementation of load balancers and consensus before packing on the load balancer discussed below at para [B 7.1], there is no limitation to the number of chains that can be bridged/cross chained parallel processing.

## B5. Unlimited scalability roll-out

B5.1 The current innovation that is being rolled out is the use of specially designed load balancers for blockchain (patent pending). Load balancers are used on the internet to transact millions of transactions per second. There is no apparent limitation on the load balancer. All requests from wallets, apps etc come to the load balancer, whose role it is to send the data to the right chain.

B5.2 The load balancers work on the hardware level (routers, switches and dedicated systems) and software level. They allocate the data according to the utilisation of the relevant chain at the relevant time with where the data is supposed to be processed.

B5.3 NuGenesis load balancers do not require a continence chain to reconnect the data from the separate chains because they have a blockchain ledger built into them with a consensus mechanism that records what is in each block and backs up to a storage chain.

B5.4 With parallel processing, scaling up to 1,000 chains parallel processing data is efficient. Data is sent through the load balancer which keeps track of the database and storage of where data is sent in the storage chains. Data can be readily searched from the explorer on the load balancer.

## B6.    Interoperability and parallel networks

B6.1    The NuGenesis multi cross chain system is designed to provide for, and promote, interoperability.  Of the multi cross chains, the NuGenesis main chain frame is built on Substrate to take advantage of substrate's interoperability features.  The EVM Palette is installed so that Eth dApps can be instantly added to the NuGenesis ecosystem and be readily interoperable.  Whilst RUST is a powerful blockchain language, existing projects use a variety of languages giving rise to multiple ways to cross chain or bridge between systems.  By having multiple languages, whatever cannot be done in the Substrate framework, can be done through another framework.

### Para-chains and Para-threads uses

B6.2    The NuGenesis blockchains provide for relay chains and para-chains.  Para-threads can be created easily as may be required.  There are situations where projects and dApps developing specific use cases justifiably benefit from avoiding the establishment of security and consensus builds of a mother chain.  (The cost of cloud storage alone is a major business consideration).  NuGenesis provides for the cost-efficient option but offers developers a more precise cost/benefit analysis with a cheap and easy NuGenesis-based blockchain modular framework to build upon that saves time, costs and distractions.  The Ledger X exchange option offers developers access to liquidity so that the choice of seeking a parachain slot is not influenced by liquidity objectives.  NuGenesis believes that the Developers' architecture should be focused on optimal tech, not choosing sub-optimal tech simply to access liquidity available in relic ecosystem.

### Parallel Networks

B6.3    At NuGenesis, we do not recommend in the concept of para-chains and para-threads for any independent project, absent a commercial justification such as cost.  Instead, our design principle is that new and existing projects should have their own customised blockchain and ecosystem.  Projects should be bridged or cross-chained as sovereign parallel networks.

B6.4    Amongst the many difficulties with the para-chain and para-thread philosophy is the inherent limitation to scalability.  The para-chain shares the same security etc of the mother blockchain.  Each parachain relies on the power of the mother chain and consequently adds resource burdens upon the entire para-network.

B6.5    Other inefficiencies arise with inherent delay from multi-node validation which increases as more nodes are necessary to support the para-chain network.  The multiplication effect kicks in where, the more pressure on the mother network, the more it requires nodes for each ecosystem.  Para-chains inherently duplicate transactions and tend to double-count them as a transaction increase which can be misleading in the assessment of transaction speed.

## Sovereign parallel blockchains, not para chains

B6.6    NuGenesis' design philosophy is that each project and enterprise application should aspire for its own sovereignty and control over its data within its own blockchain(s) and ecosystem. Existing projects which are on different programming languages and blockchain systems can be easily cross chained and/or bridged to the NuGenesis network through the substrate palettes or the Ledger X exchange blockchains.  If a new project or enterprise application desires to build a blockchain(s), even with multiple projects, they can easily use the NuGenesis framework to customise their network.  The project developers determine their own security protocols which they share with their own para-chains for their sub-projects. These projects can then be bridged to the NuGenesis system as a parallel network.

B6.7    Model applications contemplated in our design are for example, licencing or registries in a federal system.  Global remittance networks are another.  These types of use cases require their own security priorities in selecting their blockchain network with simple or authority nodes in local jurisdictions for example, and validator nodes at a federal or headquarters level, with such limitation to data storage access as is efficient for that ecosystem.

B6.8    The costs inefficiencies with parachain networks are staggering to contrast.  The number of nodes required Polkadot for example run into the hundreds and the discussed cost of a single para-chain slot is in the multiple millions of dollars.  By contrast projects running as independent sovereign parallel networks to NuGenesis will be measured in the thousands of dollars.  NuGenesis can dynamically add nodes as required.  However, NuGenesis does not even need the 5 nodes it currently uses. It can operate efficiently on 3.  The extra 2 is provided for additional capacity to cover the layer of Artificial Intelligence to monitor for any potential corruption.  Nodes can of course be added as may be required.  There are no fees charged on the NuGenesis network.  Fees are unnecessary requests on the blockchain. Projects can design their own fee structure within their own ecosystem.

## The NuGenesis Smart Chain – multi-coin options

B6.9    Practical commercial considerations, such as cost however, dictate the need for solutions that may not be theoretically ideal.  NuGenesis provides other options for projects than para chains and para networks.  As discussed below, the cheapest and easiest way for a crypto project to launch will be using NuGenesis Smart Tokens on the NuGenesis Smart Chain. These projects can create their own Coin/Token on Layer 1 (rather than Layer 2 that currently is available on the Binance Smart Chain and ERC 20).  The costs of layer 1 coin creation will be affordable and involve no running costs, storage costs and have all the benefits of NuGenesis' security, AI, cloud hosting etc.

## B7.     Data flow processing, not layer 2 processing

B7.1     With the implementation of load balancers and consensus before packing on the load balancer, the more parallel network chains that are added, the more data is injected into block creation of the connected chains.   Without a validation delay (validation occurring within a 100$^{th}$ of a microsecond), and accordingly there are more dramatic increases in the speed of transactions.   The more chains that connect with their own sovereign systems, there is no extraneous pressure on any particular system.  With parallel processing, the more systems, the faster the transactions processing.  Rather than having any layer 2 processing, NuGenesis opted for data flow processing.


**Scalability to build liquidity and support Virtual Reality Realm (Parallel worlds) – the metaverse**

B7.2     The emphasis on the speed of transactions in the millions per second, is not only because of the priority for remitters to on-board and off-board the crypto capital markets necessary to build up the liquidity pools for the NuGenesis ecosystem, but because this quantum leap in scalability is essential to the virtual reality realm, parallel worlds.  NuGenesis will shortly be announcing major partners for the Satellite network and Virtual Reality platform.

B7.3     NFTs, for example, are relatively static mediums and are typically used for art.  They can transcend the boundaries and 'gamify' and interact with other NFTS.  They can continually be 'levelling up' as they interact.  These interactions require increasingly large numbers of (micro)transactions.  NFTS, NuGenesis expects, will also become mediums for business and personal records and their adoption will be wider.  NuGenesis has built the rails for a seamless interaction between the physical and virtual worlds as the boundaries are transcended.

B7.4     The Virtual Reality Realm of 'Parallel Worlds' is an important implementation being worked on that is coming to the NuGenesis network.  It will be a virtual, but actual, place of exchange where avatars can meet, negotiate, socialise using crypto currency for services and crypto assets.  A users' Avatar is created by a scan and not easily changed to prevent cheating of the system.  There will be on-going 24/7 education, virtual offices, business, e-games and e-sports.  The virtual realm will interact with the real world, for example a user's Avatar may purchase a pizza in a virtual shop and it is delivered to their home.  Fully implemented, the network capacity must cater for millions of transactions per second, and the file size of blocks will require enormous capacity for voice messages, video streaming and digital assets created by users in virtual reality.

B7.5     NuGenesis believes parallel worlds will interact with other virtual reality realms (such as Meta – Facebook's virtual reality) in a metaverse that will eventually supersede the internet as the primary means of social and commercial interaction globally.

## B8. The continuing innovation rate design doctrine

**Forkless upgrades**

B8.2    At the most basic level, there is no risk that upgrades and necessary changes to adapt to technical innovation does not send the blockchain into a panic and wipe the data or tread into Layer 2 transactions.  Being forkless, NuGenesis does have risks involved in upgrading the network.  There are no noticeable effects on the runtime environment or downtime.

B8.3    In para [C5], we discuss the governance system that is designed to ensure that NuGenesis projects continue their innovation rate.  This means through the protocol and treasuries, on-going improvements (in the pipeline, and as will be required) are both provided for and also funded through the treasuries in the coin creation process.

## B9. Nu Genesis Layer 1 Smart Contract DNCs and NFTs/SNDA's

B9.1    The NuGenesis Smart Chain ™ and NuGenesis Smart Chain II, include the following:

(a)  Smart Contract Digital Notarised Contracts™ (DNCs);
(b)  Non-Fungible Tokens (NFTs)
(c)  NuGenesis multi-coin, Smart Tokens NST 21 (layer 1) and NST 20 (layer 2).

**Smart Contract-DNCs**

B9.2    The NuGenesis innovation to facilitate mass adoption by the mainstream economy is to go beyond existing limitations of smart contract protocols.  Smart Contract Digital Notarised Contracts™ (DNCs) allow for parties to transact with more comprehensive contracts that cater for a wide range of terms and conditions to cater for the various possibilities that can arise, and consequent allocation of risks in common business practices.  The AI capability will build suggested templates of contracts and instruments in an increasingly number of commercial scenarios.

B9.3    The AI will pull the suggested templates to a contemplated transaction, fill in the data from the respective chains and wallet IDs, and the counterparties have signed the respective DNC, the system will witness and notarise the DNC by time-stamp hash it with a unique identifier.

B9.4    Transactional scenarios may require money to be held in trust wallets, with or without multi-sigs, and impose standard business customs such as for example SGC inspections for import/export contracts.   At para [B12.11] below, the Ledger X blockchain system allows for smart contract developers to innovate with parallel processing in the smart contract protocols removing the limitation of liner time ordering and allowing for the flexibility for both vertical and horizontal events to be incorporated.

B9.5    In para [B 12], we discuss the adoption of a Blockchain Code of Conduct and Crypto laws to recognise and provide forums for efficient dispute resolution that arise in blockchain technology.  These jurisdictions can be made the forum for dispute resolution and governing law for a wider variety of templated business situations.

B9.6    Likewise, DNCs and SNDAs are discussed in part A, and para [C 3].  The DNCs and SNDAs can extend beyond digital-only object and interact with or fuse with the physical world through RFID chips, stickers and nanotech.   DNCs and SNDAs are Layer 1 assets, minted and traded on the NuGenesis blockchain.

## B10.   MINERS, STAKERS IN GREEN, ZERO CARBON

B10.1   There are several types of stakers: Stakers-only and Staker-Miners.  Platinum, Executive and Gold Stakers are stakers only.  We describe them in the reward system.  The Silver Miners however, are the staker-Miners who interact with the system.

### Miner-stakers are minters

B10.2   In NuGenesis, staker-miners are not validators.  They have a different duty.  They are minters of coin to ensure that the tokenomics run as expected.  NuGenesis is focused on maintaining a continuous and improving innovate rate in a constantly evolving blockchain ecosphere.  NuGenesis blockchains did not start with a large number of created or pre-minted coin.  Rather, the protocol is based on a minting system to reward all those participating in the various roles to support the evolution of the eco-system.

### Near-Zero energy emission

B10.3   Furthermore, the system was designed to be Green.  It was designed to eliminate unnecessary computational power being required from validation and unnecessary extrinsic requests on the system.  Moreover, mining involves no extra energy beyond that which the chain is using anyway in running on AWS or other applicable storage service.

### Creating USI's  (Universal Serial Identifier)

B10.4   In NuGenesis, the guaranteed uniqueness on any block hashing address is achieved by a randomised number known as the universal serial identifier (USI).  The USI facilitates the capabilities for blockchain parallel processing, sharding, para-chains and minting.  Coins are minted with audit trackability through the USI.  Each Coin or Crypto Asset, whether NFT/SNDA or DNC, can be serialised.  This serialisation is a foundational requirement for CBDCs (Central Bank Digital Currencies) and provides the basis for how DeFi will be revolutionised on the NuGenesis system.  Crypto assets which are serialised can be have security attached to them.  This allows for lending – including lending for crypto assets to be acquired.   It allows for multi-party ownership of different sorts at different levels, comparable to modern traditional financial markets and, consequently, Crypto assets do not have leave a users' custody to be utilised.

The below diagram illustrates the high-level design for USI implementation:
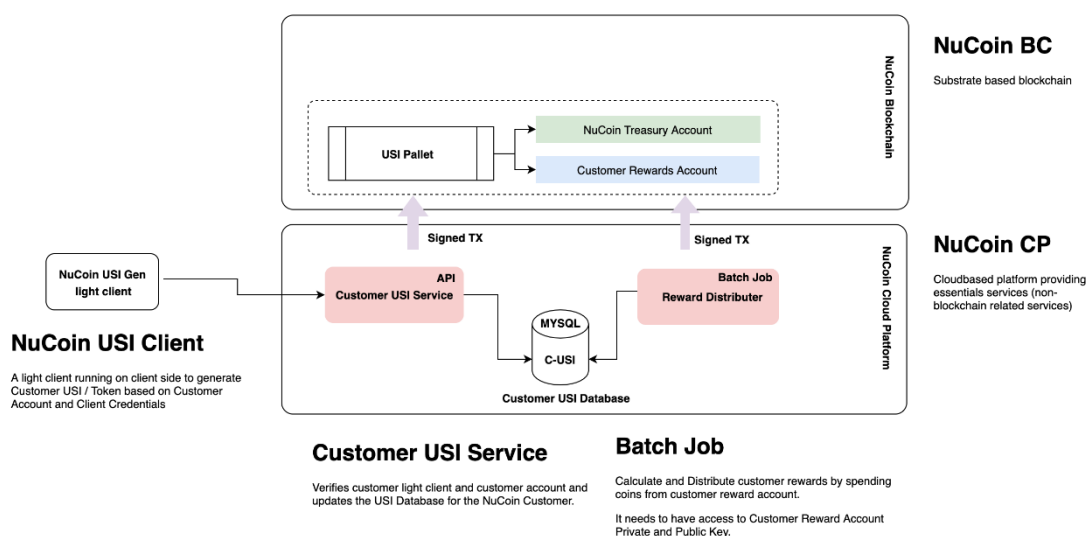


**The role of the Staker-Miner**

B10.5    The role of Staker-Miners are therefore to interact with the system: activate it and direct it to:

(a) Mint Coin; and,
(b) Create USI

This process in the NuGenesis main blockchain is vital because the doctrine of constant innovation rate funded through the treasuries, the overall development of the ecosystem depends upon the minting process. Moreover, the USI's are central to the serialisation of crypto assets which NuGenesis offers to help the advancement of the crypto economy.

## B11.    COIN CREATION, AND SERIALISATION OF ASSETS

B11.1    As identified in para [B 10.4] above, serialisation applies to blockchains that created serialised coins where there is a particular requirement for CBDCs and for blockchains dedicated to DNCs and SNDAs. Those blockchains operate on system generation rather than individual miners. Government and enterprise users do not wish to rely upon human staker-miners.

B11.2    Serialisation is not attached to ordinary NuCoin per se because it is primarily a payment coin and not designed to be a store of value. However, NuCoin can be wrapped and effectively become a DNC or SNDA. By contrast, NUI (NuCoin Investment) that is an investment token for participation in significant investment projects will be serialised for each and every coin.

B11.3    A system generated serialised NuCoin chain can be activated by community governance.

B11.4    The capability is for ordinary, serialised coin and digital asset creation on their own separate blockchains. Accordingly, if it is desirable to change the block speed from 3 sec finality to 200 nano/sec finality, according to the transactional needs.

B11.5    Ordinary NuCoins created per block are reduced in a linear algorithm by 1 every 10 years, until it reaches 0 Coin creation. The Coin Creation mechanism is attached in the Tokenomics Report in Part B2.


## B12.    THE LEDGER X EXCHANGE BLOCKCHAINS

B12.1    Ledger X is fully fledged (fiat/crypto) exchange where prices are determined by the brutality of the open market. It was designed to be an important part of the NuGenesis ecosystem to ensure capital is to be allocated by the market rather than bond curves and technocratic formulae.

B12.2    Ledger X is decentralised in that, unlike say Binance which has a central point of data storage, the data is decentralised with the 11 witness nodes across the globe.  This offers a vital security advantage without compromising the instant settlement time.

B12.3    The decentralisation is designed to encourage users to consolidate their holdings; view; monitor and manage their portfolio; apply metrics and analytics available without the risks of a centralised exchange.  Assets from other blockchains can be deposited whilst remaining interoperable.  With multi-sig, treasury wallets and allowing users to keep their private keys, it is intended to provide the user experience comfort needed to optimise mass adoption.

B12.4    Ledger X is scalable and high performance; it is designed for new projects to cheaply and efficiently create or mint coins to make available to the open market, or for existing projects to obtain further liquidity through supplemental release mechanisms.

### Tri blockchain configuration

B12.4    The Leger X exchange is a parallel processing tri blockchain configuration

The three chains include:

(1)  Settlement chain;
(2)  Match chain; and
(3)  Content chain

which are running parallel together.

### Consensus mechanisms

B12.5    The consensus mechanism involves two major protocols:

(1)  Delegated Revenue Proof of Stake; and,
(2)  Consensus before packing

the combined effect of which is that the transaction has already been processed when it goes through the block.  This tri-chain concurrent processing achieves a 1 second block speed creation finality.

B12.6    The user therefore experiences a completed order within 1 second; a speed comparable  to a centralised exchange.

B12.7 The settlement chain effects the 'consensus before packing' and the settlement. The content chain stores the data on finality, and the match chain matches the data (order matching) when trying to resolve it or search it. An explorer search will identify the ID of multiple transactions however they are processed as between the blockchains

B12.8 Like the NuGenesis blockchain, it is scalable such that parallel chains can be created and bridged. It is flexible in that it allows developers to create more vertical side-chain scenario.

**Globally dispersed super-nodes**

B12.9 The 11 witness nodes are Super-nodes that are deployed in 8 countries on four continents.
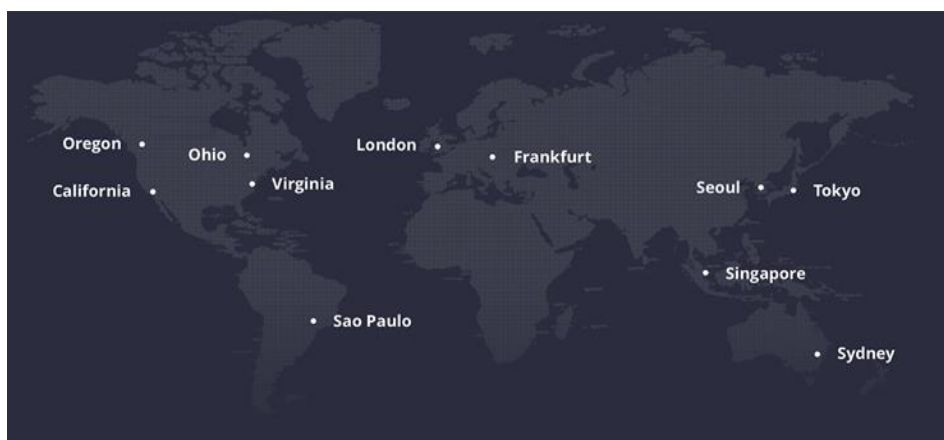


**The Ledger X Cross-Chain Agreement value circulation Hub**

B12.10 The cross-chain protocol allows assets on other public chains to be anchored though smart contracts and scripts to create or be part of newly created crypto assets on the users' Ledger X exchange wallets.
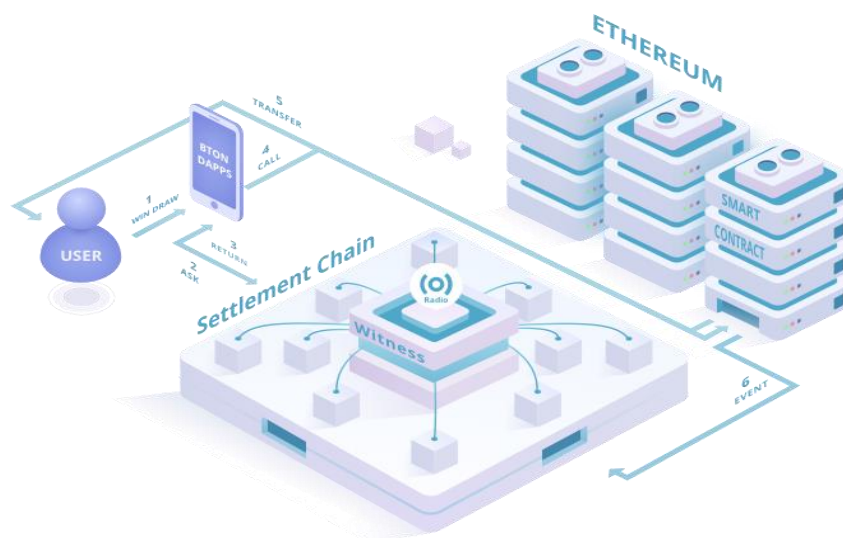
**Ledger X Side Chain protocol for smart contract parallel computing**

B12.11 A current limitation of smart contracts is that they are not designed with parallel computing in mind and operate on a linear time ordering process. The Ledger X side-Chain protocol allows smart contract developers to introduce side chain mechanisms that concurrently process providing greater flexibility for vertical side chain scenarios.
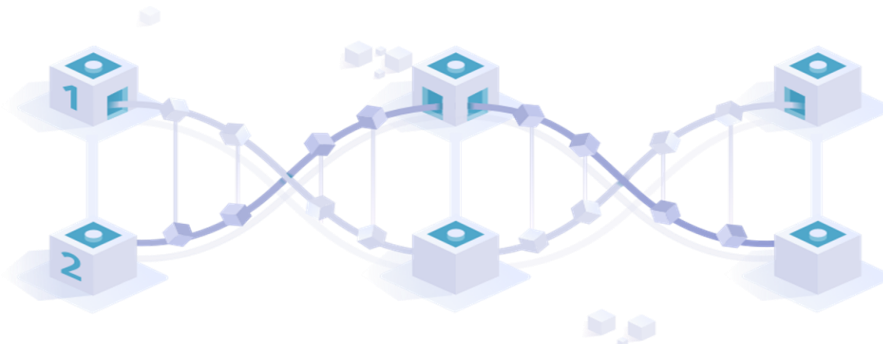


## B13.  THE NuGenesis REWARD SYSTEM

B13.1 NuCoin was not created on masse or pre-mined for pre-sale release, IDO, IEO or ICO. Rather NuCoin is subject to a tokenomics protocol balancing scarcity and liquidity necessary for optimal monetary policy in the NuGenesis ecosystem. This is discussed in the Tokenomics Reports annexed as Part B2.

B13.2 The NuGenesis blockchain systems have been developed and are fully functional. That is, unlike ICO's which raise funds off the back of a white paper for a promise to create a blockchain with the funds raised, NuGenesis has already built the blockchains before the wider global participation can be enjoyed by users.

B13.3 NuCoin is the payment currency for the ecosystem to operate and is minted per day reducing at a linear algorithm of a negative 1 per block every 10 years over a total period of 110 years.

B13.4 The NuGenesis Reward system is tied to the minting of Nu Coin. The minted coins per day are disturbed by the treasury through a series of sub-treasuries for the following purposes:

(a) on-going funding for the NuGenesis ecosystem and continual innovation;
(This is represented by the Tech Fund Treasury, Legal Treasury and Investment Treasury)

(b)  on-going rewards and payments for governance and participation throughout the ecosystem which includes the 313 executive and governance positions described in the governance system;

(c) return of investment being the smaller category of reward to the early investors taking a higher risk and stakers;

(d) the Silver Staker-Miners who function it is to mint coin and create USI; and,

(e) the participant members who through their membership in the Cooperative NuGenesis Community receive free daily airdrop NuCoin rewards of 10% of all NuCoin minted each day.

# NUGENESIS

A diagram of the reward allocation is as follows:
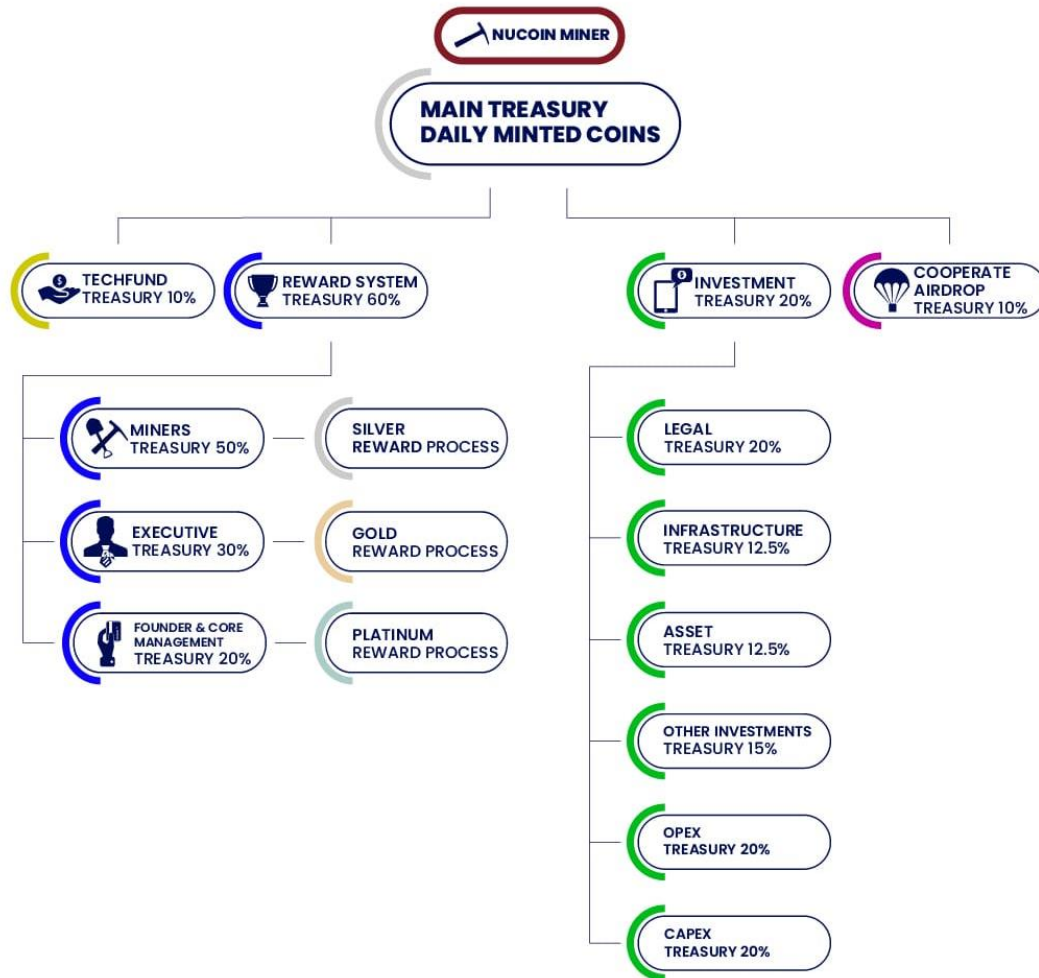


**Mining: the staker-miners or Silver Miners**

B13.5    Unlike other blockchain models where Miners receive the Coin they mine, with NuGenesis the Staker-Miners or Silver Miners instead work for the system.  They consequently receive a 30% reward of such NuCoin they caused to be minted each day.

B13.6    The mining is designed to require negligible computational resources and can be done in a matter of seconds, predominantly on the user's smart phone.  Moreover, bots can be hired by the Miner to mine for them by paying the bot 10% of the Miner's reward.

B13.7    The NAVIS AI System does not trust miners and creates a secondary mining capacity to pick up any slack from the daily coin creation tokenomics requirement (being 34,560 Coins per day in the first 10 years).  The AI System will burn off automatically anything in excess of the coin creation required.

B13.8    It is possible to 'turn off' this AI system minting back up should future governance voting decide so.

# NUGENESIS

### B 13.9 The Tokenomics Report

Attached as part B(2) to this White Paper is a Tokenomics report prepared by an independent Tokenomics expert. NuGenesis' view of valuation of the ecosystem is set out in [C 11]. We have attached the Tokenomics Report as part of this White Paper because it sets out in detail with useful graphics of the Coin Creation, Treasury functions and the rewards for miners.

### NuCoin Pie Chart Holdings at time of White Paper

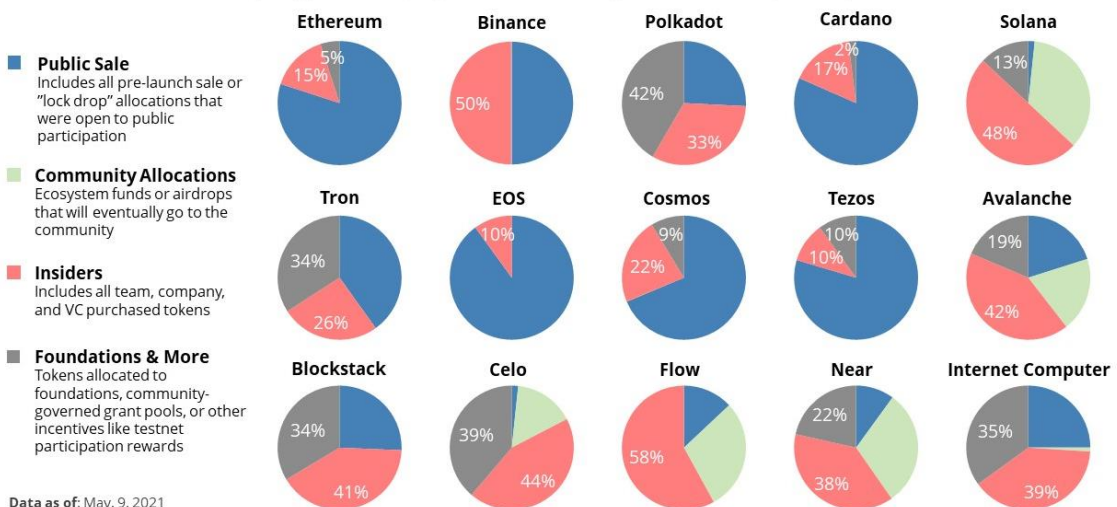B13.11 The Pie Chart of the Allocation of Existing NuCoin is represented below:

## NUGENESIS Pre-Launch Token Allocation



- Founder and Core Management
- Other

13%

87%
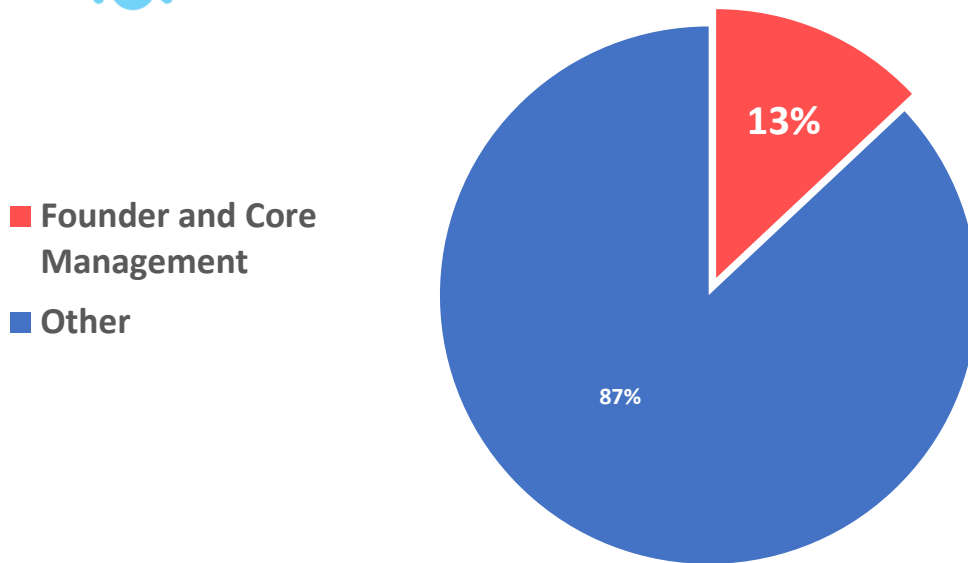
This is to be contrasted with various other projects as follows:

### Initial Token Allocations for Public Blockchains

Concentrated insider ownership may permanently impair blockchains' ability to become credibly neutral public infrastructure



**Public Sale**
Includes all pre-launch sale or "lock drop" allocations that were open to public participation

**Community Allocations**
Ecosystem funds or airdrops that will eventually go to the community

**Insiders**
Includes all team, company, and VC purchased tokens

**Foundations & More**
Tokens allocated to foundations, community-governed grant pools, or other incentives like testnet participation rewards

**Data as of**: May. 9, 2021
**Source**: Messari, CoinList, Various Blogs

B13.12 The observable features of the allocations, it is submitted is:

(i) the Founders and Core Devs have a relatively modest holding given the blockchain networks ecosphere development paid for to the operational state.

This is suggested to compare favourably to traditional blockchains were there are enormous pre-release creation of coins or pre-minting that are sold to investors whose funds are used to build the blockchain and hopefully bring it to an operational stake.

(ii) the Founders and Core Devs are locked in for 2 years plus cannot sell their NuCoin where the price impact is or could be 10%.

(iii) the Founders and Core Devs are, to the extent they contribute to on-going governance and management, rewarded through the daily minting process. Such a reward structure is designed to incentivise a team to remain committed to the longer-term interests of the NuGenesis ecosystem.

(iv) there is an allocation of NuCoin to strategically important investors that provide disproportionate economic benefit by virtue of their coin holdings than a more typical investor regardless of size of holding.