

Analog Timepaper

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1 Introduction: Analog and Harnessing Time on the Blockchain

1.1 Time as a problem to be solved

The concept of time is central to our existence and perception of history, yet we lack either a consistent and consensus driven definition or a reliable means of measuring and documenting its passing. As illustrated by differing interpretations of history, conflicting recollections of past events and widespread inefficiencies from scheduling disagreements, our ongoing inability to agree on time is at the root of significant practical and ideological problems.

What is widely accepted, however, is that time exists as a causal chain. The advent of any particular instant leads directly and sequentially to the next instant. A corollary of this principle is that an effect cannot occur from a cause that is not already in the past. Any specific event has causal factors, all of which exist in the past, and will have its own effects, all of which lie in the future. It is this characteristic of time that makes it suitable to be recorded for posterity on the blockchain, a technology that by definition leverages the power of consensus to record data permanently and securely in a sequential fashion.

1.2 Consensus and the blockchain

Time is a unique piece of the history of cryptocurrency dating back to before Satoshi Nakamoto mined Bitcoin's genesis block. In the original code, Nakamoto references a protocol where participants provide proof of work and add blocks to a Timechain, thereby creating a system for participants to agree on a single history. But almost nowhere does this word get used or referenced after 2013, until early 2015 when two coders, [Elías Snær Einarsson and Matthew Roberts](#) decided to make it a proper noun and give their cryptocurrency project, which was aimed at changing

the relationship between on-chain transfers, key storage, and authentication requirements, the name [Timechain](#).

Proof of work based mechanisms enshrine data permanently onchain, with all validators having spent both time and money (in the form of energy) to arrive at a consensus version of a ‘truth’ to be recorded. It is the costs expended that give this truth its value, in the same sense that bitcoin as money derives its value from the time and energy expended to mine it. Similarly, it is this mechanism that gives time data recorded onchain its credibility, derived from numerous independent stakeholders having providing their proof of validation. The linear, immutable and uncensorable properties of the blockchain make it the ideal (and first) technology able to comprehensively record time in a searchable, sortable and trustworthy manner.

1.3 Introducing Analog

Analog is the outcome of the realization that blockchain is the answer to the problem of time being both very difficult and very important to record and monitor.

Analog creates a system for participants to agree on a single history by utilizing the [causality of hash chains](#) and the unpredictability of proof of time, the blockchain network provides a mechanism for establishing an indisputable history of events. With causality, what came before and what came after is impossible to alter.

Analog plans to create a mechanism through which Oracles can vote and confirm the real-world time data being submitted. Time data management has become a major bottleneck not just for data-intensive applications, but also users. Thus, Analog plans to create an indexable and searchable Timegraph, which works similar to bitcoin, where new blocks are added above the previously created blocks, in a first in last out mechanism. People can search and see a real time history of the other

time events, referred to as “Analog”, that have occurred, preceding any particular event. This would allow people to collate any gaps in the time information. For example, if someone searched “how John Doe” landed a job at a particular firm, they would be able to review the stream of Analog that occurred over John Doe’s lifetime that led him to his current position. These Analog could include his birth place, name of his college, past employment history and more.

This allows users to particularly benefit from the advantages of real-time events, as the Analog network treats each participant as a node in its Timegraph, submitting time data to the blockchain for validation from randomly selected nodes in the vicinity. It’s not just a blockchain network, but an app that allows businesses and individuals to feed time data for a variety of things. We connect people through the lens of time. Analog seeks to satisfy the innate human curiosity of “when” something is happening. We see the world as a time automated world where Analog serves as a 'proof of time'.

Once you surface time, a lot can be done with it like getting people to perform a call-to-action within a predefined duration. In some cases, acting within a timely manner could be the difference between a life and death situation, for example, the [Champlain South Towers incident](#) where lives could have been saved if we had the preceding time data in the Analog graph.

People often think of money as their most valuable resource, so at Analog, we are tying up money with time in the form of rewards using our native token. Our goal is to merge money (a tangible asset) with time (an intangible asset) to help people deploy a time graph of every event.

2 Use-cases

Analog's mission is to accurately record time data by leveraging the Oracle to track, log and verify real-world information on the blockchain in the form of a time graph. To achieve this endeavor Analog is building solutions to some of the common problems associated with time, across various industry verticals.

2.1 Shipping / Delivery Services

High sales volumes around peak times such as Christmas can result in order backlogs for online retailers and delivery services. This can result in deliveries being delayed, poor visibility for customers on package's status and even cancelled orders.

Analog's Timegraph API can reduce delays by allowing e-retailers to reward 3rd party suppliers with tokens and can allow for greater visibility of package delivery status by users to follow the supplier's supply chain and inventory system in real time.

2.2 Construction & Maintenance

It's critical for buildings and other infrastructure to be maintained and renovated in a timely manner. Delays could cause structural damaged or even collapse like the [Surfside Condominium](#) in July 2021.

Analog has identified six parties that, in unison, contributed to the collapse of the building. These include the original building contractors, condo inhabitants, renovation consultants, insurance companies, eyewitnesses (person filming the water spillage in the garage), and city government officials. Theoretically, if time was tracked and events were accurately recorded, the collapse could have been prevented, thereby saving over 98 lives. Analog Timegraph API could be utilized to incentivize via token rewards the submission of time data and via smart

contracts initiated warnings and alerts that result in remedial action that ultimately prevented the structural collapse.

2.3 Workplace / HR

Organizational success is underpinned by timely delivery of work. Delays and pushed timelines result in poor performance outcomes, lost clients and ultimately a reduced bottom line. Organizations of all sizes typically struggle to implement and monitor performance metrics designed to reduce tardiness.

Analog can power a Dapp that incentivizes employees via token rewards, administered by smart contract managed system of rules, alerts and reminders that rewards timely behaviors and penalizes lateness. Individual's performances can be tracked, recorded and measured based on token incentives and progress reports and metrics can be extracted from the Timegraph.

2.4 Influencer / Brand Marketing

In order to stay relevant, influencers must follow updates, promotions and collaborations from numerous high profile brands. With multiple brands and media platforms being utilized, it can be challenging to ensure all salient information and timelines are tracked.

Analog's Timegraph API incentivizes all parties to feed time data into the graph whenever there's a new product launch, a new collaboration announcement, event, giveaway, sale, podcast, or AMA. Furthermore, consumers are incentivized to contribute towards the Timegraph by posting personal content like reviews and feedback, on the platform, and linking it to the brand.

2.5 Hospitality

Poor scheduling and time management can result in delayed check-ins due to unprepared rooms, inappropriate cancellation of late guests' reservations and housekeeping coinciding with guests' usage of their rooms.

Analog's Timegraph API allows for communication and coordination between the hospitality provider, guests, internal services (housekeeping, front desk) and third parties (airlines, airports etc) to minimize scheduling related issues.

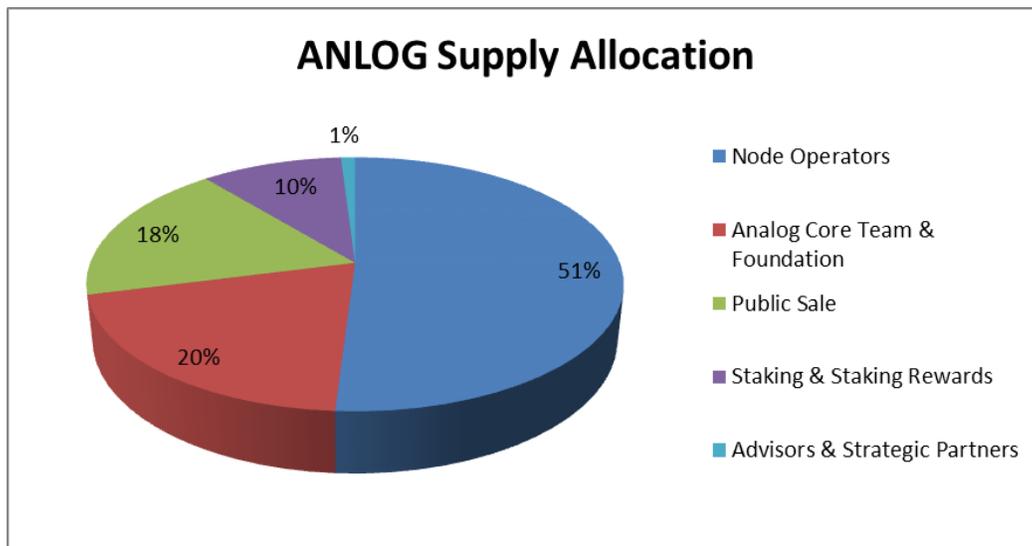
2.6 Finance

Busy scheduling or inattention can lead to missed bill or credit card payments, resulting in additional expenses, reduced credit ratings and service cancellations.

3 ANLOG: Supply & Tokenomics

The Analog network will initially utilize an ERC-20 token (ANLOG) to incentivize and coordinate desired behaviors by nodes, consumers and stakers. ANLOG can be traded publicly from Q4 2021 or used by network participants to pay for time bound call-to-actions. A total supply of 13.800 billion ANLOG will be distributed per the below schedule:

Stakeholder	Allocation (Bn)	%	Vesting
Node Operators	7.038	51%	Ongoing
Analog Core Team & Foundation	2.760	20%	6 Years
Public Sale	2.484	18%	6 Years
Staking Rewards	1.380	10%	Ongoing
Advisors & Strategic Partners	0.138	1%	6 Years
	13.800	100%	



Nodes: Nodes are rewarded with 51% of the ANLOG supply for proactively participating in the network. Rewards are tied to the nodes ‘time relevancy’ score which individual nodes can improve by increasing their productivity – increasing time relevancy leads to increased share of rewards.

Core Team & Foundation: 20% of the supply is reserved for the core Analog team and the Analog One Foundation, a non-profit organization created to develop and maintain the network.

Public Sale: To facilitate fundraising and public adoption of ANLOG, 18% of the supply will be distributed via public sale. See [‘Public Sale’](#) section for use of raised capital.

Staking Rewards: 10% of the supply is allocated to fund staking rewards
Advisors & Strategic Partners: 1% of the supply is allocated to our advisors and strategic partners, with a 6 year vesting period.

4 Public Sale

Funds raised during the token sale will be utilized for the following key activities:

1. Enhance the custom Timechain that powers the Analog Timegraph
2. Develop an API to channel real-world data into smart contracts, and provide the framework for applications and nodes on the network to interact with one another
3. Continue development and maintenance of the primary Analog mobile and web application
4. Create a Time Incubator to grow and fund projects built within the Analog ecosystem
5. Development and maintenance of the Analog Developers and Business Intelligence Unit.

5 Technicalities

5.1 Client

Analog will be initially built on the Proof of Work Ethereum client, Hyperledger Besu. The privacy of the time transactions is protected by customizing Hyperledger Besu and the Orion transaction manager with the privacy group feature. However, the Orion privacy group ID is unprotected by default and the current versions of Hyperledger Besu and Orion fails to provide necessary features for securing the entire Decentralized Application (DApp), including key management and intrusion detection. We therefore propose a multi-user level encryption scheme to securely share the privacy group ID among the privacy group

members. In the future we aim to develop a decentralized exchange (Dex) and will create a custom blockchain similar to Solana or Binance Smart Chain (BSC).

5.2 Oracles

Oracles serve as a critical component of the Analog ecosystem's architecture and are leveraged to support the validation, access, and transmission of time data from external sources. The oracle framework addresses the origin of time data, properties, and encryption methodology to secure the data source as well as facilitating other developers to integrate the Analog system into their applications.

5.3 Staking

ANLOG tokens can be staked to help secure the network, in return for in kind staking rewards. Staking rewards account for 50% of the total rewards pool.

5.4 Nodes

'Nodes' refers to a participant within the Analog ecosystem with the ability to submit time data to the Analog ledger. Anyone can act as a node, including individuals, businesses or other commercial enterprises.

Nodes are rewarded for submitting time data to the network with ANLOG rewards. The extent of the rewards is based on a Timegraph relevancy score determined by productivity within the network, thus incentivizing nodes to proactively participate.

5.5 Analog Wallet

Users will have Web3 and mobile access to the Analog Wallet, enabling them to store and manage their ANLOG tokens, including the ability to stake and transact directly from the wallet interface.

6 Tentative roadmap

The platform and ANLOG token rollout will occur in phases, with a preliminary roadmap as set out below:

Aug 2021: Public Sale, Analog Wallet and Web3 integration.

Sept 2021: 3 CEX listings, ANLOG Tokens listed on DEXs (Uniswap, PancakeSwap) non-profit foundation created, rollout business channel/support, primary marketing push.

Oct 2021: 5-10 new CEX listings.

Nov 2021: Release public Analog Time Graph API.

Dec 2021: Testnet blockchain explorer, rollout enterprise channel/support, genesis block Q1 2022: 20 new CEX Listings, Dapp platform launch.

7 Community

To bring the project to life, we are building a community of individuals and businesses. This community development will be driven via actively managed Discord and Telegram groups with community managers incentivized with ANLOG from the Analog One Foundation.

We are actively seeking theoretical physicists, mathematicians, actuaries and computer scientists to come join us in helping to optimize how the ANLOG token works, and its incentive rewards economics.

Learn more about the project and community at the [Analog website](#).

8 Our Team

We are a globally dispersed team of experts in physics, cryptography, computer science, economics, and fintech systems.

In today's market, it appears that many token offerings come to market with little or no governance implemented. In response to this, a steering committee will be initiated with members from the advisory board. All members of the steering committee will have specific roles, aligned with specific business issues, as well as a general responsibility to ensure that the project proceeds in line with our defined roadmap.

Legal Disclaimer: ANLOG Token is designed to be a utility token which functions as the unit of payment and settlement between participants who interact within the Analog ecosystem. ANLOG Token does not in any way represent any shareholding, participation, right, title, or interest in the Governing body, the Issuer, its affiliates, or any other company, enterprise or undertaking, nor will ANLOG Token entitle token holders to any promise of fees, dividends, revenue, profits or investment returns, and are not intended to constitute securities in the United States or any relevant jurisdiction. Ownership of ANLOG Token carries no rights, express or implied, other than that which may be afforded by Analog and/or any other third parties whom may use such Tokens.