



Network

THE XY ORACLE NETWORK

The **Proof-of-Origin** Based
Cryptographic Location Network



Network

BLOCKCHAIN JUST ENTERED THE REAL WORLD

With the XYO Network, developers gain the power to
interact with the **real world** as if it were an API





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THE FIRST CRYPTO-LOCATION NETWORK BUILT FOR THE WORLD OF TOMORROW

Today, smart contracts are increasingly being used to execute contracts **automatically**, **transparently** and **trustlessly**. This, in effect, means lawyers, middlemen and escrow are unnecessary and may someday become obsolete. However, smart contracts have one key limitation: they rely in most cases on centralized data sources for data input.

Additionally, there is often a limited offline application for them. The XYO Network makes it possible for smart contracts to **access the real world** by using XYO Network's ecosystem of devices to determine if an object is at a specific XY-coordinate. With this power, applications can be developed which execute transactions in the **smart contract** upon location confirmation.



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THE XYO NETWORK


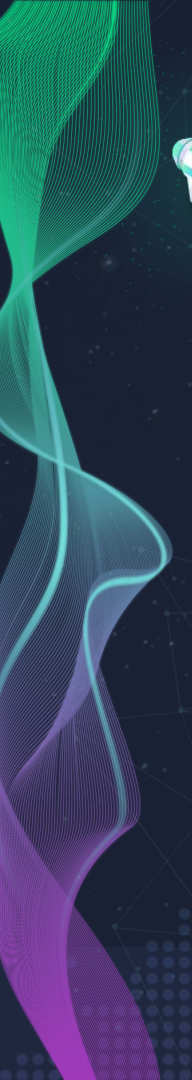
Current blockchain technology leverages its own powerful properties, such as time-stamping and decentralization, and combines them with devices that are hard to trick. The weakness of smart contracts centers around oracles that use a single source of truth (and thus have a single source of failure), and crypto-location systems face the same problem. The vulnerability in current crypto-location technologies revolves around the devices that report back an object's location. In smart contracts, this data source is an oracle.

The true innovation at the core of the XYO Network centers around a location-based proof underlying the components of our system to create a secure, crypto-location protocol.

WE PROPOSE that the most important advancement necessary for bridging the present to the future rests on the world's ability to trust machines. This trust is best achieved through innovations in blockchain technology, and must be made available through the creation of a crypto-location oracle network that is resistant to attack and achieves unprecedented accuracy and certainty within the given restraints of the system.



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*“The introduction of the XYO Network is perhaps the **single most** exciting token breakthrough in blockchain history.”*

- Arie Trouw, Founder & Architect



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KEY FEATURES OF THE XYO NETWORK



DECENTRALIZED

Verification does not involve any large, fee based corporations or institutions. The XYO Network runs on a completely transparent and autonomous system. It is free to use (open source) and has no entrance barriers (fair competition).

TRUSTLESS

Power and trust is shared between the XYO Network's participants rather than concentrated in a single, fee-taking individual or entity. The XYO Networks blockchain technology eliminates the need for trust by making all transactions transparent, decentralized, and secure.

IDENTITYLESS

Location data is stored anonymously, thusly protecting the privacy and safety of all XYO Network users. This is achieved by combining a zero-knowledge proof with a cryptographic method we call Proof of Origin.



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WHAT IF BLOCKCHAIN TECHNOLOGY COULD BE BRIDGED TO THE REAL WORLD?



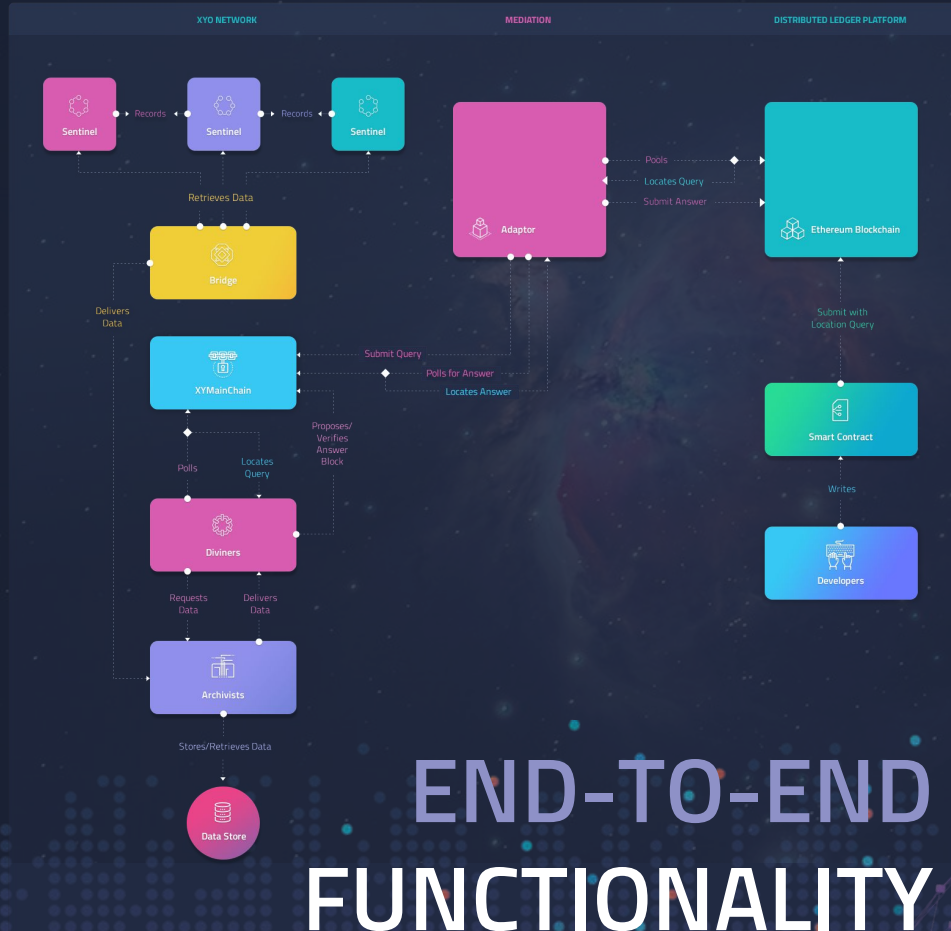
SINCE THE ADVENT OF ETHEREUM, the cryptoassets community has experienced rapid-growth in the form of DApp development and protocol improvements. However, up until this point, every platform (including Bitcoin and Ethereum) has focused almost entirely on digital channels (the online world), instead of real world channels (the offline world).

PROGRESS has begun in the physical realm with the introduction of offline-focused cryptographic platforms that concentrate on specific use cases, such as the intersection of blockchain and the Internet of Things (IoT). In addition, there are efforts being made to develop protocols that concentrate on the intersection of location and blockchain, which are being labeled Proof of Location. These platforms and protocols are useful components that serve as a spoke in the wheel of the XYO Network.

HOWEVER, we still find the majority of blockchain technologies confined primarily to the narrow scope of the Internet. Since its founding in 2012, XY Findables, the company behind the XYO Network, has been building a location network in order to make the physical world programmable and accessible to developers. In brief, XY has been working towards the concept of enabling developers (such as those writing Ethereum smart contracts) with the power to interact with the real world as if it were an API.



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THE XYO NETWORK is designed to be an abstraction that can interact with any smart contract capable, public blockchain such as Ethereum, Bitcoin + RSK, EOS, NEO, Stellar, Cardano and others. To interact with the XYO Network, users on Ethereum, for instance, can issue queries to our XYO smart contract and pay in **XYO Tokens** (ERC20). The nodes in our own XYO Blockchain, called **Diviners**, would constantly be polling Ethereum for these queries and be reward in the native currency of our own **XYOMainChain** (which are also called XYO Tokens). In the future, we will do a one-to-one conversion from holders of our ERC20 token into our own blockchain's native currency in order to provide our platforms with transaction fees that support micropayment requirements necessary for scalable IoT use cases. In these cases, we will allow users to issue queries directly to our blockchain instead of interacting through a public smart contract.



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HOW DO WE DO IT?



Traditional trustless systems rely on a private key for signing transactions or contracts in a system. This works very well with the assumption that the node on the network that signs the data in question is physically and virtually secure. However, if the private key is compromised, then the ability to prove origin falters.

PROOF OF ORIGIN is the key to verifying that ledgers flowing into the XYO Network are **valid** and relies on the concept of a **Bound Witness**. A unique ID for source of data is not practical since it can be forged. Private key signing is not practical since most parts of the XYO Network are difficult or impossible to physically secure, thus the potential for a bad actor to steal a private key is too feasible. To solve this, the XYO Network uses **Transient Key Chaining**. The benefit of this is that it is **impossible to falsify** the chain of origin for data. We determine the certainty that an **oracle** witness node in a trustless system gathered the data that it is sharing by calculating an **Origin Chain Score**:

$$Score = \prod_{i=0}^{i=n} \frac{PcL * PcD}{Pc' Pc'' O}$$

BOUND WITNESS is a concept which allows **Origin Chains** to be built for use in determining **Proof of Origin**. It is achieved by the existence of a **bidirectional heuristic**. Given that an untrusted source of data used to resolve a digital contract (an **oracle**) is not useful, we can substantially increase the **certainty** of the data provided by first establishing the existence of a bidirectional proof of location. The primary bidirectional location heuristic is proximity, since both parties can validate the occurrence and range of an interaction by cosigning the interaction. This allows for a **zero-knowledge proof** that the two nodes were in proximity of each other. All nodes (**Sentinels**, **Bridges**, **Archivists**, and **Diviners**) are considered "witnesses." This allows for any data that is relayed from one node to the next to be bound.

INTRODUCING:
PROOF OF ORIGIN AND BOUND WITNESS

THE XYO NETWORK COMPONENTS



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SENTINELS

are location witnesses. They observe data heuristics and vouch for the certainty and accuracy of the heuristic by producing temporal ledgers. The most important aspect of a **Sentinel** is that it produces ledgers that **Bridges**, **Archivists**, and **Diviners** can be certain came from the same source. They do this by adding **Proof of Origin** to a relay chain of cryptographic proofs.

DIVINERS

answer a given question by analyzing historical data that has been stored by the **Archivists**. Heuristics stored in the XYO Network must have a high level of **Proof of Origin** in order to measure the validity and accuracy of the heuristic by judging the witness based on its **Proof of Origin**. Given that the XYO Network is a trustless system, **Diviners** must be incentivized to provide honest analysis of heuristics. Unlike **Sentinels** and **Bridges**, **Diviners** use Proof of Work to add answers to the blockchain.



BRIDGES

are location data transcribers. They securely relay heuristic ledgers from **Sentinels** to **Archivists**. The most important aspect of a **Bridge** is that an **Archivist** can be sure that the heuristic ledgers that are received from a **Bridge** have not been altered in any way. The second most important aspect of a **Bridge** is that they add an additional **Proof of Origin**.

ARCHIVISTS

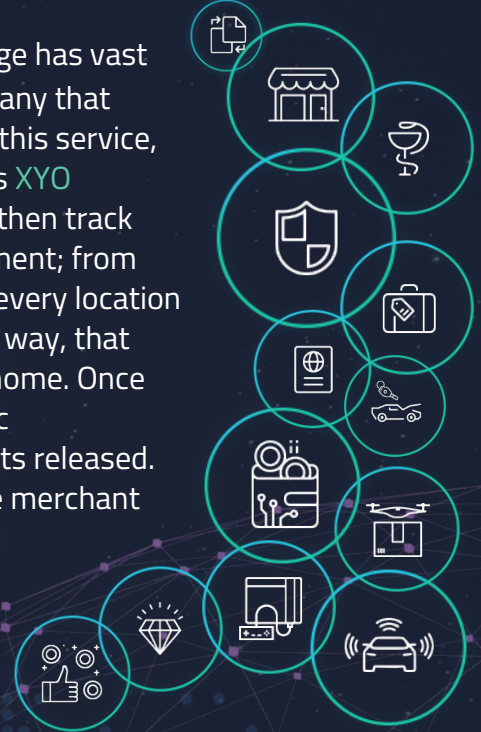
store location information from **Bridges** in a decentralized form in order to make data available to **Diviners**. **Archivists** also index ledgers so that they can return a string of ledger data if needed. Each time data is handed off from one **Archivist** to another, additional **Proof of Origin** is appended in order to track payment, since all **Archivists** get paid. **Archivists** store raw data only and get paid only for retrieval of the data.



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FROM STRAIGHTFORWARD TO COMPLEX, the XYO Network's usage has vast applications that span a multitude of industries. For example, take an eCommerce company that could offer its premium customers payment-upon-delivery services. To be able to offer this service, the eCommerce company would leverage the XYO Network and XY Platform (which uses XYO Tokens) to write a smart contract (i.e. on Ethereum's platform). The XYO Network could then track the location of the package being sent to the consumer along every single step of fulfillment; from the warehouse shelf to the shipping courier, all the way into the consumer's house and every location in between. This could enable eCommerce retailers and websites to verify, in a trustless way, that the package not only appeared on the customer's doorstep, but also safely inside their home. Once the package is confirmed to be in the customer's home (defined and verified by a specific XY-Coordinate), the shipment is considered complete and the payment to the vendor gets released. The eCommerce integration of the XYO Network thusly enables the ability to protect the merchant from fraud as well as ensure consumers only pay for goods that arrive in their home.

This is just the tip of the iceberg; from the Hospitals, Airlines, Rental Car Agencies, and Insurance Agencies of today to the Drone Delivery Systems and Autonomous Driving Cars of tomorrow, it is apparent that the use cases of the XYO Network are infinite and the potential is unlimited.



**THE XYO NETWORK PROVIDES
INFINITE SOLUTIONS**

CRYPTOECONOMICS: THE CURRENT PROBLEM



THERE IS AN ELEPHANT IN THE ROOM when it comes to modern cryptoeconomics: many coins have become more useless than the assets they were seeking to displace (fiat currencies). Most cryptocurrencies today focus almost exclusively on incentivized systems that reward miners; they do not focus on building incentives for token users. Over time, this imbalance creates an undesirable ecosystem for every participant involved (miners, token holders and tertiary entities who build upon its platform).

In any healthy economic token system, there is a balanced ratio of liquidity. In the case of [Bitcoin](#) and even [Ethereum](#), a very small minority of mining pools controls the majority of the ecosystem. This creates a problem each token system aims to solve: centralization.

The XYO Network believes that the value of a token should remain in direct proportion to its utility, which to some degree relies on the number of transactions it participates in.

CRYPTOECONOMICS: OUR SOLUTION



IN AN XYO CRYPTO-LOCATION MINING POOL there are XYO Miners (e.g [Sentinels](#), [Bridges](#), [Archivists](#), [Diviners](#)) who take part in answering queries to the XYO Network. In this pool, if a majority of [XYO Miners](#) are of low quality, the entire pool of XYO Miners can vote to set the location-verification bar low.

However, as soon as more competitive machines are introduced to the pool, the system votes to increase its ideal-state for the system.

Thus, instead of relying on the computing technology of a few centralized mining pools with access to the most powerful resources, the progression of the XYO mining system stays in direct proportion to the [advancements](#) in computing technology of the world. This is one of the many ways the XYO Network addresses implementation shortcomings and proposes solutions that recalibrates [cryptoeconomic dynamics](#) and revolutionizes [blockchain cryptocurrency technology](#).

CRYPTOECONOMICS: HOW WE FIX IT



WE USE XYO TOKENS TO INCENTIVIZE the desired behavior of providing accurate, reliable location heuristics. **XYO Tokens** can be thought of as “gas” needed to interface with the real world in order to verify the XY-coordinate of a specified object.

The process works like this: A token holder first queries the XYO Network with a query (e.g. “Where is my eCommerce order package with XYO Address 0x123456789...”). The query then gets sent into a queue, where it waits to be processed and answered. A user can set their desired confidence level and XYO gas price at query creation.

The cost of a query (in **XYO Tokens**) is determined by the amount of data required to provide an answer to the query as well as market dynamics. The more data needed, the more expensive the query and higher the XYO gas price. Queries to the XYO Network have the potential to be very large and expensive. For instance, a trucking and logistics company could query the XYO Network to ask, “What is the location of every single car in our fleet?”



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CRYPTOECONOMICS: HOW WE FIX IT



ONCE THE **XYO TOKEN HOLDER** queries the XYO Network and pays the requested gas, all **Diviners** working on the task call out to the relevant **Archivists** to retrieve the pertinent data needed to answer the query. The data returned is derived from the **Bridges**, who originally gathered the data from the **Sentinels**. **Sentinels** are the devices or signals that verify the location of objects. These include entities such as Bluetooth trackers, GPS trackers, geo-location tracking built into IoT devices, satellite tracking technology, QR- code scanners, RFID scanning and many others.

If the data provided by a **Sentinel** device (such as a Bluetooth Beacon) is used to answer a query, then all four components involved in the transaction receive a portion of the XYO gas paid by the token holder: the **Diviner** (who searched for the answer), the Archiver (who stored the data), the **Bridge** (who transmitted the data) and the **Sentinel** (who recorded the location data). The distribution of the gas between 3 of the 4 components of the XYO Network is always given in the same proportion. The exception is that of **Diviners**, whose involvement in the process of providing an answer is more extensive. Within each component, gas gets distributed evenly.

XYO TOKEN MAIN SALE



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TIMELINE AND DETAILS:

» **START:** March 20th, 2018

» **END:** May 20th, 2018

» **TOKEN:** 1 XYO = 0.00001 ETH or
1 ETH = 100,000 XYO *

*The above represents the starting price. The public token sale has a tiered pricing structure that starts at 1 ETH: 100,000 XYO and maxes out at 1 ETH: 33,333 XYO. Details regarding our volume and time based pricing structure will be announced soon.

DISCLAIMER:

All unsold and unallocated tokens will be burned after the token sale event.

For every token sold to the public one token will be generated for XY The Findables Company. 3.2 billion tokens will be pre-generated for the company and team.

Please keep in mind that XY Tokens do not represent equity, they are utility tokens for the XYO Network. If you are interested in purchasing equity in XY Findables, please refer to our SEC qualified and regulated Reg A+ equity sale:

<https://www.xyfindables.com/offering/>

XYO TOKEN SPECIFICATIONS



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THE XYO TOKEN ("XYO") is a utility token that smart contract developers can use to access geo-location verification from the real world. In order for your smart contract to access the outside world, it must use the XYO Network, which requires use of the **XYO Token**.

The **XYO Tokens** are currently only accessible via private, trusted channels. If you would like to be placed on the waiting list to learn more about the **XY Token ("XYO")**, please sign up on our website at <https://www.xyo.network/>.

DETAILS:

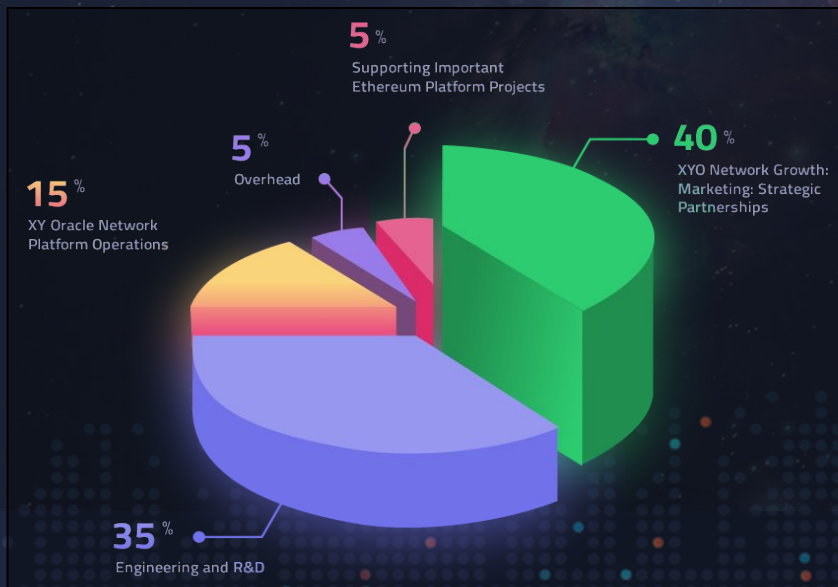
- » SMART CONTRACT PLATFORM: **Ethereum**
- » CONTRACT TYPE: **ERC20**
- » TOKEN: **XYO**
- » TOKEN NAME: **XYO Network Utility Token**
- » TOKEN ADDRESS: **0x55296f69f40ea6d20e478533c15a6b08b654e758**
- » TOTAL ISSUANCE: **Finite** and **capped** at the amount reached after the **XYO Token Main Sale**
- » PROJECTED XYO TOKEN CAP: **\$48 Million**
- » UNSOLD AND UNALLOCATED TOKENS: **Burned** after the token sale event. No further **XYO Tokens** will be generated after the **XYO Token Main Sale** ends.

TOKEN SALE PROCEEDS



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PROCEEDS FROM THE XYO TOKEN SALE are allocated in accordance with the long-term development goals of the XYO Network, which include funding important **Ethereum** projects (the **Casper Protocol**, **Sharding**, Scaling Initiatives and location-specific blockchain projects run by smaller development teams).





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WHO WE ARE

THE XYO TEAM is comprised of seasoned engineers, business development professionals and marketing experts located in downtown San Diego, California. Arie Trouw solely founded XY Findables in 2012. Scott Scheper and Markus Levin joined as co-founders of the blockchain initiative in 2017 to assist in building the XY Oracle Network.

The XYO Network will be built upon an existing infrastructure of 1,000,000 devices that have been distributed throughout the world via our consumer-facing business, XY Findables. XY's Bluetooth and GPS devices allow everyday consumers to place physical tracking beacons on the things they want to keep track of (such as keys, luggage, bikes and even pets). If they misplace or lose such items, they can see exactly where they are by viewing their location on a smartphone application. In just six years, XY has created one of the largest consumer Bluetooth and GPS networks in the world.

We are fortunate to have a consumer business that has successfully built this real-world network. Most location networks fail to reach this phase and attain the critical mass necessary to build out an extensive network. However, the Sentinel network we have established is only the starting point. The XYO Network is an open system that any operator of location devices can plug into and begin earning XYO Tokens.





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WHO WE ARE

FOUNDERS

ARIE TROUW:

FOUNDER -
ARCHITECT

MARKUS LEVIN:

CO-FOUNDER -
HEAD OF OPERATIONS

SCOTT SCHEPER:

CO-FOUNDER -
HEAD OF MARKETING

DIRECTORS, MANAGERS, SUPERVISORS

CHRISTINE SAKO:

HEAD OF ANALYTICS

JOHNNY KOLASINSKI:

HEAD OF MEDIA

JORDAN TROUW:

CUSTOMER EXPERIENCE MANAGER

LEE KOHSE:

SR. DESIGN ENGINEER

LOUIE TEJEDA:

WAREHOUSE LOGISTICS SUPERVISOR

KEVIN STANLEY:

SENIOR MARKETING MANAGER

MARYANN CUMMINGS:

CLIENT SUPPORT MANAGER

PATRICK TURPIN:

HARDWARE QA SUPERVISOR

VICKY KNAPP:

SR. ACCOUNTING MANAGER

WILLIAM LONG:

HEAD OF HARDWARE



XYO ROADMAP



Network

XY has been building towards an open world of location-verification since 2012 by launching a successful Bluetooth-GPS consumer business critical to understanding and building a real-world location network. Today, XY has over 800,000 beacons across the world.

2017

XY Releases Ground-breaking GPS Tracking Device: The "XYGPS":

XY launches the world's first hybrid GPS and Bluetooth technology enabling the XYGPS to report location anywhere in the world where Cellular and GPS data is available.

XY Releases The XY4+ Device:

XY releases the XY4+ device which makes it capable of operating as an XYO Network node via firmware update.

XY Crosses the 1,000,000 Beacon Mark:

The one-millionth XY device is born.

XY's Blockchain-Based Oracle Network Is Born:

Development of moving the internal XY location network platform to an open blockchain implementation begins; the XY Oracle Network is born.

2018 Q1 & Q2

XY Mints The First "XYO Token" to Be Used For Smart Contracts to Access the XY Oracle Network:

The first **XYO Token** is created and represents the official currency to be used throughout the entire XYO Network.

XY to Complete XYO on Test Network ("XY TestNet"):

XY will complete the development of the XY Oracle Testnet and begin rolling out its location-focused blockchain protocol to its **Sentinel** devices.

XYO ROADMAP



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2018 Q3 & Q4

XY to Launch XY Oracle Main Network ("XY MainNet"):

XY introduces the GAMMA Application, which enables various tools and functionality for blockchain developers to begin generating smart contract code to interact with the real world.

XY to Complete API for Smart Contract Developers to Interact with the XY Oracle Network:

Release of the XYO Network API that enables smart contract developers to write contracts to interact with XY's network; libraries to be developed: [Ethereum Solidity library](#), [Ethereum Viper library](#) and [JavaScript library](#) for websites to interact with XY's Oracle Network (similar to the [Web3.js](#) integration with [MetaMask](#)).

XY to Release XY Sticker-Based Beacon Trackers, Which Can be Added to eCommerce Packages:

Launch the "XY-Stick" product which enables eCommerce retailers to track every single one of their products in realtime.

2019

XY to Grow Global Network of Diversified Location Sentinel Devices:

Grow coverage of XY [Sentinels](#) (location data providers and verifiers) as well as other components of the XY Oracle Network ([Bridges](#), [Archivists](#), [Diviners](#))

XY to Launch SatoshiXY and VitalikXY LEO Satellite Sentinels:

Stakes will be sold in the XYO Network's Low Earth Orbit satellites; stakes represent ownership in the piece of the [XYO Token](#) rewards.

XY to Onboard Larger Businesses, Organizations and Retail Companies That Have Use-Cases for Location Verification:

Formalize business partnerships with enterprises and larger entities, which can benefit from a decentralized, trustless location oracle (e.g. logistics, supply chain, work hour tracking, eCommerce and countless other niches).

2020+

XY to Expand Global Reach of Entire XYO Network