ETHERNITY

DECENTRALIZED CLOUD COMPUTING

Whitepaper

4 August 2013

v1.3

DISCLAIMER:

The ETHERNITY Tokens are a crypto asset that is currently being developed by the ETHERNITY developers, whose website can be found at https://ethernity.cloud.

This whitepaper does not constitute an offer or sale of ETHERNITY Tokens (the Tokens) or any other mechanism for purchasing the Tokens (such as, without limitation, a fund holding the Tokens or a simple agreement for future tokens related to the Tokens).

Any offer or sale of the Tokens or any related instrument will occur only based on definitive offering documents for the Tokens or the applicable instrument.

ABSTRACT

The traditional cloud infrastructure has many central points of failure and trust: (1) The centralized nature of the Domain Name System (DNS) (2) dependency on one or multiple cloud providers for service availability (3) centralized storage of user-data.

The ETHERNITY project envisions the cloud computing infrastructure to be an environment where the user's data is hosted on a wide range of systems in an encrypted and anonymous manner. From home computers, mid-range servers, to datacenter level of hardware could be utilized with ETHERNITY, fully trusting that the data is safe and private while in transit, and at rest.

ETHERNITY removes the middle-men consisting of cloud service provider companies and replaces them with the Ethereum blockchain. The ETHERNITY nodes are meticulously programmed virtual machines that obey the blockchain. Users' software and data run inside ETHERNITY nodes exactly according to the Ethereum smart contract agreement. These nodes are location-agnostic, self-replicating and constantly spawning in random locations on the internet.

This allows the user's software and data to be online and run FOREVER. The design of the smart contracts and the underlying infrastructure of ETHERNITY is backed by a team which cumulates more than 60 years of experience in cloud computing. The technology that has been developed successfully over the past 5 years.

ETHERNITY is crucial to freedom of speech in the current internet environment of censorship.

ETHERNITY can be utilized as base infrastructure for an online library such as Wikipedia.

ETHERNITY can ensure high availability of online resources by avoiding a single point of failure like traditional cloud storage solutions.

ETHERNITY can be the answer for any other decentralized service or web application that demands true high availability.

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I. Introduction

The past ten years gave witness to a migration of software from the desktop, home and small business servers, to the cloud infrastructure which stores users' data on remote, but centralized servers. The centralized servers are a primary target for hackers. Over 1.9 billion records were lost to data breaches in first half of 2017 alone, many of which involved cloud computing servers. [1]

The ETHERNITY infrastructure software is built on top of open-source services and technologies. Using industrywide open source technologies and standards, the migration from regular, centralized cloud providers to ETHERNITY is quite simple. Other proposed decentralized hosting solutions are overly complex and try to reinvent the wheel. We strive to make the transition to the decentralized cloud as transparent, secure, and simple to the end-user as possible. In addition, ETHERNITY SDK allows for everyone to contribute and start their own decentralized solutions.

Several challenges exist when trying to create a fully decentralized cloud infrastructure. The decentralized solution must provide similar performance, and scalability. At the same time, it must maintain the software's continuous availability, privacy, integrity, and anonymity.

The purpose of ETHERNITY is to provide the blockchain infrastructure for participants to run their favorite cloud software decentralized, to rent their idling or extra hardware for monetary gain, all this while incentivizing the decentralized cloud applications developers.

Developers interaction with ETHERNITY is critical to the rapid adoption of our platform. Every instance a service is provisioned using a specific decentralized cloud application, the application developer receives a bonus percentage of the transacted amount. We believe it is a step in the right direction for any developer to join our effort to expand the decentralized cloud by integrating existing cloud applications into ETHERNITY's decentralized cloud!

II. Architecture

ETHERNITY is designed to meet the following goals:

1. **Privacy and anonymity**. Service buyer's data is encrypted at all times using strong open encryption algorithms. All network communication should happen over anonymous networks to preserve buyer's anonymity. Our aim is for the sellers is to be able to monitor their resource usage but be unable to interfere or tamper with the service running on their computers. Any attempt is prohibited by the network service monitoring system.

2. **Decentralized Domain Name System.** Service buyers benefit from the decentralized DNS blockchains or public services. ETHERNITY supports the developers to implement these technologies in their decentralized applications.

3. **Continuous Availability.** Buyer's services are available at all times due to the design that allows multiple instance of the same node to run and sync continuously. Anytime one of the instances fails for any given reason, all other instances will still be up and ready to resume the service. They will be spread geographically according to the buyer's preference.

4. **Performance.** Buyers are able to rate their service sellers, and this ensures the service sellers are providing their advertised service at full capacity; creating a more competitive market, and a better service overall provided to the buyers.

II.1. Encryption

Our architecture is designed to favor the most secure encryption and hashing algorithms while keeping the overhead low to prevent performance drops. This section covers encryption of data on the blockchain, encryption of data in transit, and encryption of data at rest.

Due to privacy concerns, we consider imperative to encrypt the information that is being exchanged across the network. The ecosystem is designed in a manner that prevents decryption of data in transit even with the current most advanced cryptographic attacks including brute-force and collusion attacks.

Equally important is the encryption of data at rest. When ETHERNITY was designed consideration was emphasized on trust-less business model. Data is stored across the network; however, the decentralized cloud service providers will be unable to access, read, modify or interfere in anyway with the ETHERNITY node that runs on their machine.

Similar to the blockchain technology, ETHERNITY uses a trust-less design model. Members of the network are considered by default untrustworthy. The open-source software code ensures and enforces the trust, reassuring the decentralized cloud users about their data safety while handled by different parties.

II.2. Anonymity

Privacy today is one of the top priorities worldwide, especially with the centralization of the cloud and expansion of the big data. Malicious actors can easily identify content owners and with the standard IP-based communication user's personally identifiable information (PII) can be linked to their data. Security breaches in the past occurred in which personally identifiable information was exposed due to the non-anonymous and centralized processing of user's PII on tradition cloud-based solutions.

Unless otherwise regulated by the law, private users, private enterprises, and government agencies should be able to store and run their software anonymously. This strengthens freedom of expression at all levels while protecting users' privacy rights.

ETHERNITY uses **anonymity** alongside encryption for all the connections that will be performed on the network. This is accomplished with technologies that route the user's traffic on the internet. The exchange encryption keys occur at different levels to discourage attackers from linking communication partners.

This kind of anonymity techniques is applied for **wallet communication, node communication, decentralized cloud applications communication.**

II.3. Decentralized DNS

The current DNS infrastructure of the internet is very centralized, therefore making it vulnerable to attacks. The current DNS can be attacked in several ways: cache poisoning, hijacking, DDoS, censorship. All these attacks are avoided by using a decentralized system that propagates DNS records.

ETHERNITY utilizes this technique. Due to its difficulty level, it is not easy to implement. The concentration of the efforts to assist decentralized cloud application developers/packagers is ETHERNITY's focus. The developers will have the ability to easy convert or straight build up their decentralized web application by following guideline provided by the ETHERNITY project. The developers decentralized applications will be available both on the classic DNS and the decentralized DNS services.

Regular Internet users outside the ETHERNITY network will be able to access the decentralized cloud application through the regular DNS as well the decentralized DNS free of charge by using simple and minimum intrusive open source tools.

II.4. Continuous availability

Several key factors must be taken into consideration when proposing and designing a decentralized cloud platform. The most important factor being service availability.

Currently the uptime SLA of cloud service providers depend on their physical, logistic, and hardware capabilities. These capabilities are limited. It can be difficult and expensive to guarantee 100% uptime when the architecture of the network is concentrated in few specific locations. The hardware needs to be maintained through regular maintenance and unexpected events occur.

ETHERNITY is designed with continuous service availability at its foundation. The service buyer's data is replicated in a highly secure and anonymous manner across the network. Leveraging the decentralized nature of the platform, 100% service availability is achievable at a much lower cost than traditional cloud solutions.

II.5. Performance

The actual cloud services provider market is misleading when looking for the best service money can get. This is because it is difficult to properly run conclusive benchmarks. Currently there is no unbiased feedback system available for cloud service buyers to objectively rate or make an informed choice on services.

Due to its decentralized nature, ETHERNITY implements a voting and feedback system. This allows service buyers to directly rate they service sellers. The decentralized nature of the system allows for the service providers and developers to increase or decrease their service price based on their service quality level., resulting in a more competitive and variant cloud services market. The rating system is backed by technical statistical proof to avoid abuse or malicious reviews.

Leveraging the blockchain, the rating system is designed to be unbiased, and clear. It allows the service buyers to decide to aim temporarily or permanently for cheaper services. With either a focus on slightly lower performance or more expensive services, with better overall performance depending on their end-state goals.

III. Circular economy

Total EU expenditure on Cloud services
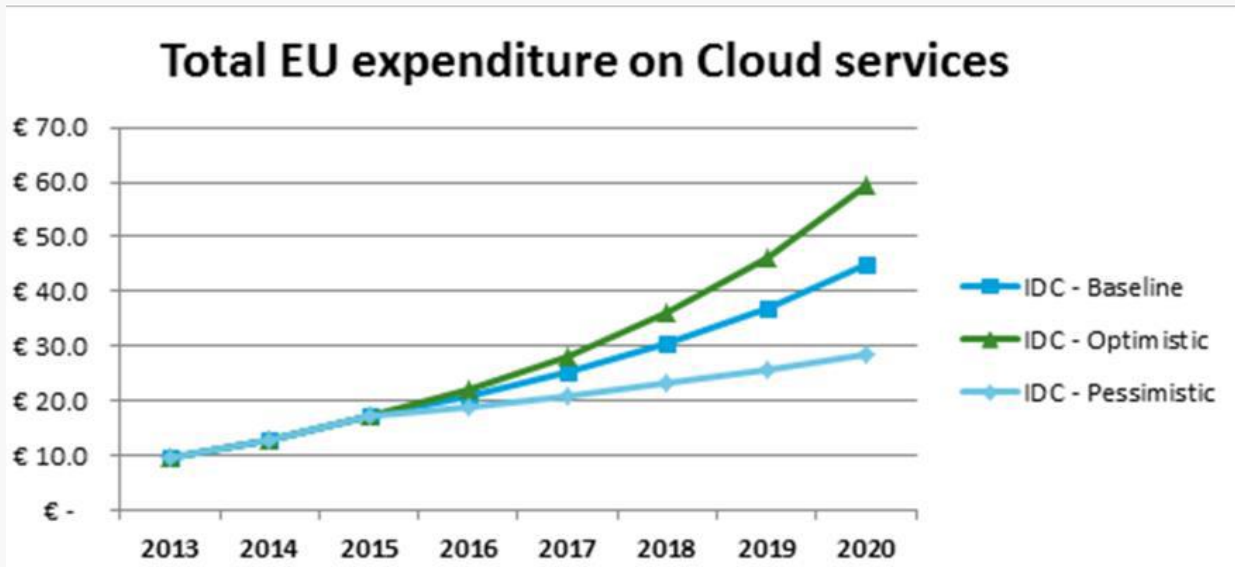
See above IDC prediction for the EU cloud services market till 2020 in billion EUR.[2]

Gartner Worldwide Public Cloud Services Market - billion USD
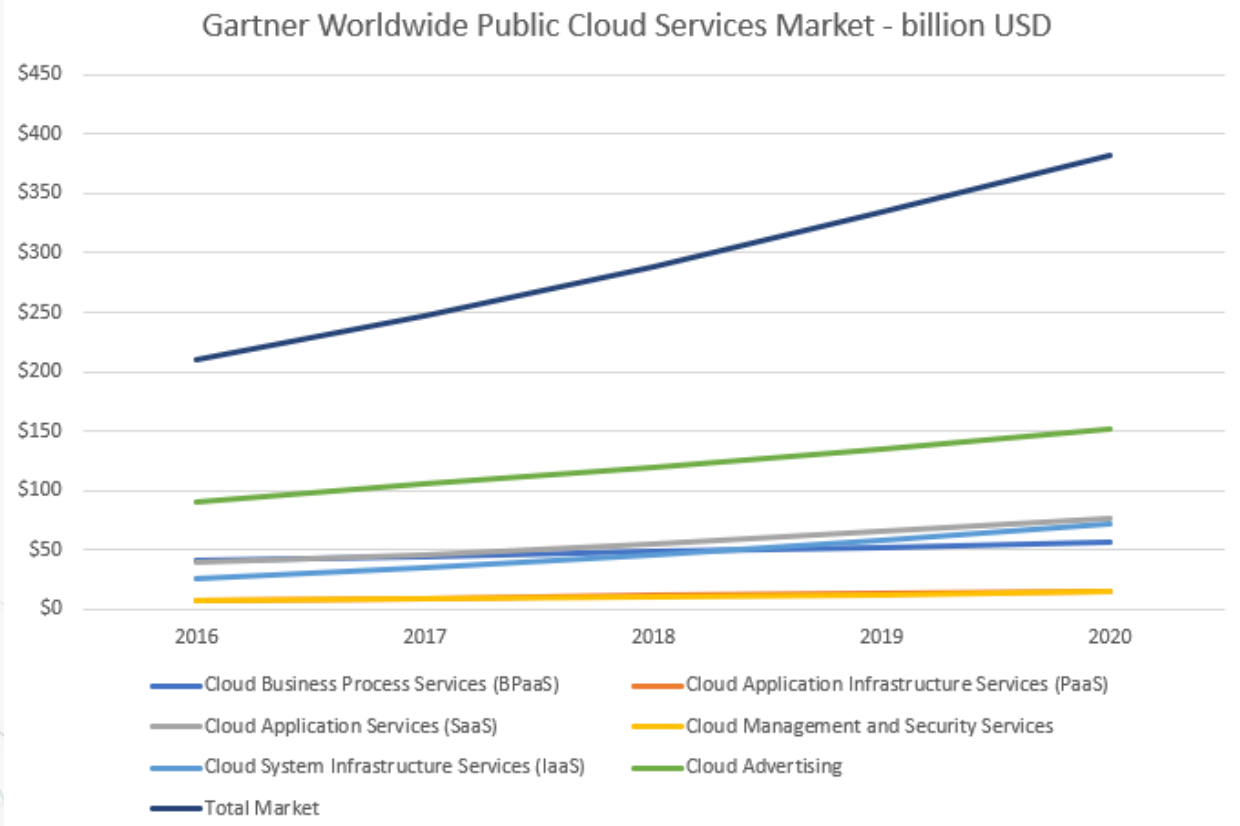
See above Gartner prediction for worldwide public cloud services market till 2020 in billion USD.[3]

The dawn of the digital age has begun, and we strongly believe that the circular economy is a concept which benefits society and there are already a handful of very successful projects that make use of the circular economy model.

ETHERNITY contributes to the circular economy concept by allowing people to monetize their idle computing power and storage, which otherwise does not happen. This decreases the overall price of the cloud services and because of its decentralized nature, will further diversify the cloud services market.

ETHERNITY users can both act as service buyers (cloud users) and service providers (miners), therefore they can easily recover the money they spend to run their decentralized cloud application and content by renting their spare hardware to other ETHERNITY service buyers.

This way, all ETHERNITY users can host their cloud application and content online FOREVER, without deep technical knowledge, backed up by a trustworthy blockchain contract, continuously available, anonymous and encrypted and location independent.
Join the revolution, subscribe for updates on our website and social media channels!

Stay tuned for updated versions of this whitepaper.

IV. Tokenomics
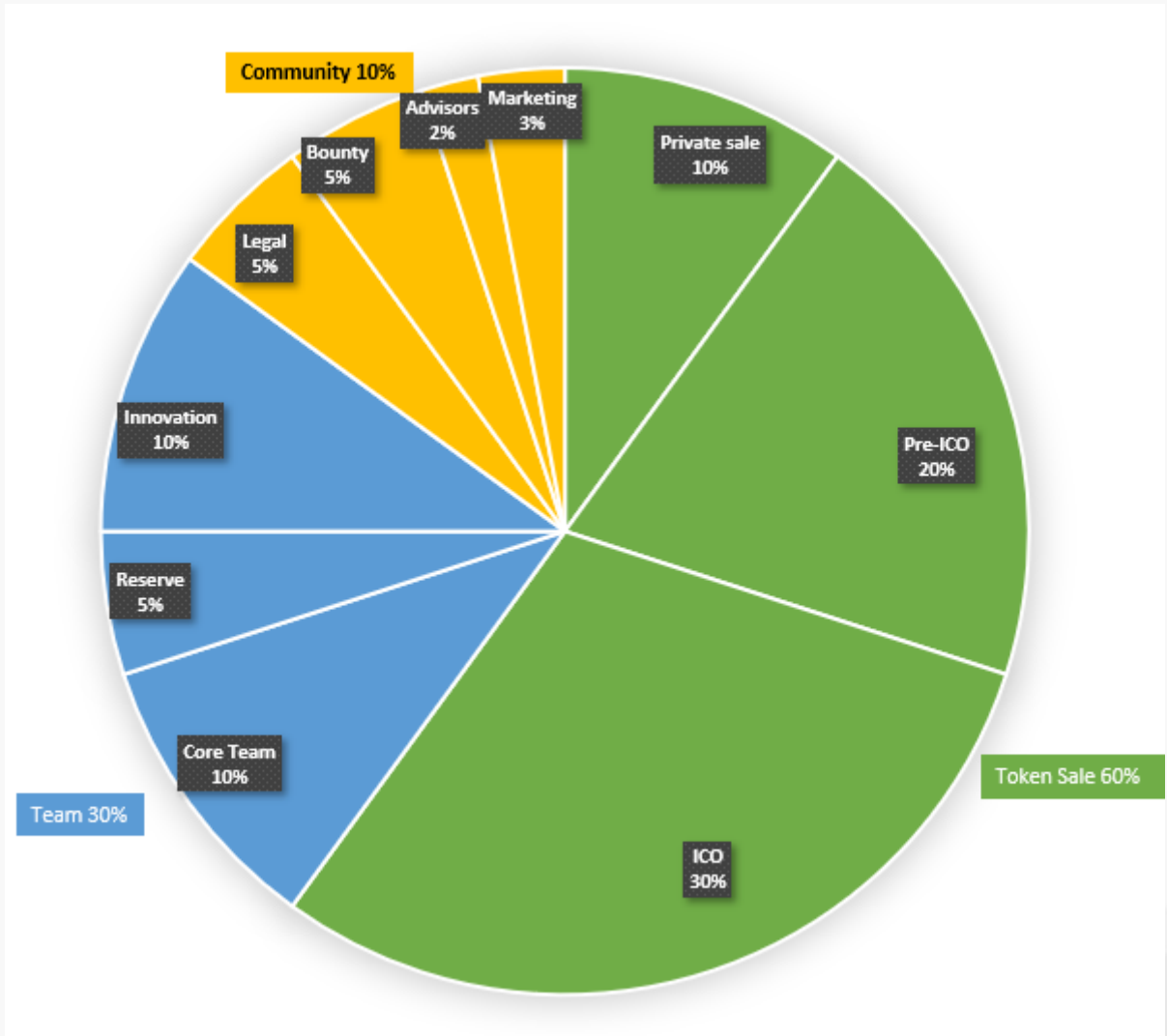
Symbol: ETNY
Platform: Ethereum/ERC20
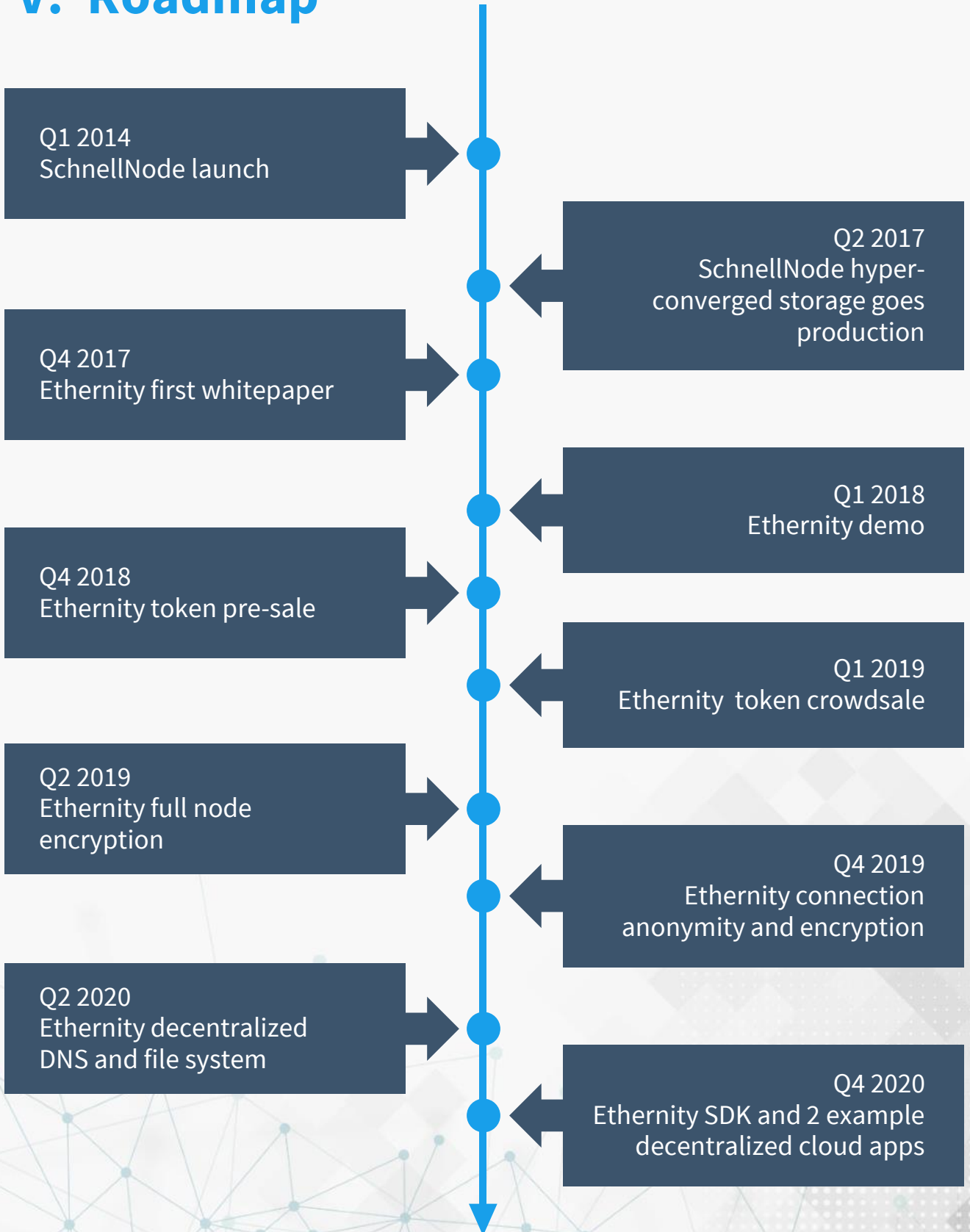Price: 0.027 USD
Soft Cap: 4000000 USD
Hard Cap: 16200000 USD
Maximum Supply: 1000000000 ETNY
Unsold tokens adjustment: Burning
Team tokens lock: 2 Years

V. Roadmap

Q1 2014
SchnellNode launch

Q2 2017
SchnellNode hyper-converged storage goes production

Q4 2017
Ethernity first whitepaper

Q1 2018
Ethernity demo

Q4 2018
Ethernity token pre-sale

Q1 2019
Ethernity token crowdsale

Q2 2019
Ethernity full node encryption

Q4 2019
Ethernity connection anonymity and encryption

Q2 2020
Ethernity decentralized DNS and file system

Q4 2020
Ethernity SDK and 2 example decentralized cloud apps

VI. References

[1] - http://breachlevelindex.com/assets/Breach-Level-Index-Report-H1-2017-Gemalto.pdf

[2] - http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=41184

[3] - https://www.gartner.com/newsroom/id/3616417

THANK YOU!

For more info, please visit
👆 https://ethernity.cloud