UNCHAINET

**HETEROGENOUS CLOUD
COMPUTING INFRASTRUCTURE**

WHITE PAPER

V2.0.0

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Abstract

The internet is continually evolving. Thirty years ago, only large enterprises owned big data centres and startups needed to invest large sums for their own servers[1]. If they became successful, they often had a very short time to increase their capacity by spending even more in infrastructure. Times often were quite difficult for innovation.

Today there are multiple cloud providers which allow startups and large organizations to rent "servers," or rather computing resources, on a per-second basis and to adjust capacity in a few clicks. However, cloud providers are dominated by a few large players.[2] There is a risk of the whole server hosting market being consumed and dominated by them. Although there appears to be a price war at the moment that is lowering prices[3], it could change in the future and lead to decreased competition, price increases and dangerous centralization of power in the hands of a few.

We believe we present a solution, which could help individuals, hosting providers and companies owning unutilized datacenters to get worldwide reach within minutes by connecting to the Unchainet network, renting their available server resources to a broad audience, and earning money while supporting the open internet. We call this **beneficial mining.** We expect that the consumed energy might bring value (benefit) to clients and might not be wasted in large amounts merely to keep the network running.

Cloud clients could at the same time be able to access substantial computational power for research, AI training, or for web and API hosting at better prices. These would be based on current market pricing and very low Unchainet network maintenance fees.

Unchainet aims to be more than "just another" cloud provider. We expect to build the Unchainet network with blockchain technologies at its heart, allowing resource trading in its **UNET cryptocurrency,** which is intended to run on a fast custom-made blockchain with a **Proof of Beneficial Work** algorithm. **Introducing a cryptocurrency as a mean of exchange is intended to enable true cross-border and real-time sharing of computing power without restrictions.** Quality and trustworthiness of nodes (i.e., providers) is expected to be consistently and transparently monitored by **QoS Chain technology,** allowing free transactions on a massive scale while keeping true decentralization, all backed by a resource trading crypto-economy.

In later phases of the project, this is intended to allow UNET tokens to be used outside of the Unchainet platform, powering **microtransactions** in other apps. The modular Unchainet blockchain architecture and our "blockchain as a service" offering is expected to enable developers to create **custom blockchain apps** with significantly more use cases than current smart contract platforms.

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[1] https://en.wikipedia. org/wiki/Data_center#History.

[2] https://www.sdxcentral.com/articles/news/big-4-cloud-providers-will-continue-dominate-analyst-says/2017/07/.

[3] https://www.cloudyn.com/blog/aws-vs-azure-price-war-and-nutrition-facts-for-the-cloud/.

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1. Introduction

1.1 Why is the cloud ready for a major disruption?

In 2006 Amazon Web Services started with a then new business model of public computing cloud[4]. With the promise to convert the high capital expenditure of businesses investing in private data centres into an operational subscription expenditure, it was a revolutionary concept. Businesses simply didn't have to invest tens of thousands of dollars upfront into an infrastructure with a high risk of losing the investment. Instead, they could run their workloads for a fraction of the cost on an hourly basis. It was truly a remarkable shift that enabled a significant amount of innovation[5]. Shortly after that Microsoft, Google, IBM and other large players entered the field and started to bring small and large businesses into their platform.

However, in 2018 we see the original promises of lower costs apparently left unfulfilled. Cloud companies are generating huge profits, yet many companies that were originally bullish on cloud transformation are pulling back as they realize it is no longer profitable.[6] Pricing of the current cloud services appears to be one of the biggest concerns for clients, but there seems to be more to worry about. Companies have concerns about their data ownership as well as security and thus, hybrid and private clouds have emerged.[7] This, however, leads to pre-2006 problems with CapEx. Companies end up having a big problem of underutilized 'zombie' servers (it is estimated 1/3rd of all servers in North America are underutilized).[8] [9] Additionally, there may be an unhealthy market consolidation that is centralizing computing power in the Big 4 cloud providers and stifling competition from smaller providers.[10]

1.2 Cloud

Unchainet aims to define a new status quo by developing an open source software for cloud providers supported by a network of individuals, hosting providers, companies with unutilized datacenters, and "ex-cryptocurrency-miners." By combining computing resources, this network will be capable of competing with large cloud providers by combining existing open source technologies with the Unchainet platform and the **QoS Chain.**

Unchainet plans to monitor the quality of individual nodes in the network with **QoS Chain (see Chapter 4),** a blockchain for measuring and transparently storing node reputational data in the public distributed ledger. This key technology is expected to allow clients to choose their level of service and pricing based on their needs and also allow Unchainet to serve mission-critical workloads on high-quality nodes.

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[4] https://aws.amazon.com/about-aws/whats-new/2006/08/24/announcing-amazon-elastic-compute-cloud-amazon-ec2---beta/.

[5] https://www.ibm.com/blogs/cloud-computing/2017/05/17/cloud-drives-enterprise-innovation/.

[6] https://www.crn.com.au/feature/why-australian-companies-reverse-out-of-the-cloud-468197

[7] https://www.zetta.com.au/cloud-101-difference-public-private-hybrid-cloud-solutions/.

[8] http://whatis.techtarget.com/definition/zombie-server-comatose-server

[9] https://anthesisgroup.com/wp-content/uploads/2015/06/Case-Study_DataSupports30PercentComatoseEstimate-FINAL_06032015.pdf

[10] https://www.crn.com.au/news/the-big-four-continue-to-dominate-cloud-infrastructure-wars-470427

We plan for clients to purchase computing resources in the same way they are familiar with on current cloud platforms. The Unchainet MVP will focus on spot instance pricing (or pre-emptible VMs) which is an auction-based platform where clients may bid to use resources and use them until a higher bidder comes in. In later phases, after enough test data has become available, the Company intends to introduce guaranteed per-minute pricing and long-term bookings.

The optimal use cases for the bidding platform and lower quality nodes will likely be workloads involving large-scale computations with frequent state commits. These tasks generally do not suffer from sudden shutdowns as clients design their computations to save progress frequently. Example tasks might include research computations, deep neural network training or 3D and video rendering.

Higher quality tasks include standard longer-term resource allocations where high availability, durability, and security are important. Classic website hosting is a great example of such a task as it requires high availability and no dropouts.

1.3   Cryptocurrency Payments

Unchainet's key value proposition for clients is its expected cost-savings. This will be achieved by market pricing based on a liquid provider/client market and by very low 2.5-10% fees (based on provider quality) on resource bookings, compared to the estimated 32% EBITDA of AWS.[11] With such a tight margin (i.e. 2.5-10%), our solution should be very competitive with credit card, PayPal, and bank transfer fees. For this reason, we believe that developing a cryptocurrency may provide an elegant and cost-effective solution to trading Unchainet computing resources, which has led us to plan the launch of the UNET cryptocurrency.

We intend that UNET will initially be an Ethereum based ERC20 token, but after implementing the Unchainet blockchain main network, it would be migrated in a 1:1 ratio to the native token. We believe that some of the principal reasons why the world needs a better cryptocurrency than Bitcoin and Ether include:

- Transaction times - it can sometimes take an hour to transfer bitcoins from one account (wallet) to another[12]

- Transaction costs - average bitcoin transaction fees can be over $10 and may still be rising - this may make bitcoin problematic for microtransactions[13]

- Capacity - currently, bitcoin can only handle about 3-4 transactions per second. When compared to Visa, which can process up to 24000 transactions per second[14], there is a lot of room for improvement

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[11] https://www.forbes.com/sites/greatspeculations/2017/10/25/aws-to-help-drive-amazons-top-line-growth-marginsto-remain-under-pressure/#55b5887068ed
[12] https://thenextweb.com/hardfork/2018/02/02/a-brief-history-of-bitcoin-mining-hardware/.
[13] https://twitter.com/Blockchair

- Energy cost - in the early bitcoin days it was possible to run bitcoin software on personal computers.[15] Today, to process the aforementioned 3-4 transactions per second, the bitcoin network often requires large specialized computer farms which can consume significant energy[16]

- Decentralization - the original idea of bitcoin as a decentralized currency is now endangered by large mining pools who may have power over bitcoin decisions and can affect the future development of the network as a whole[17]

While we love the original idea of bitcoin as a decentralized payment platform, we believe there are too many shortcomings to make it viable as an everyday transaction platform.

Unchainet tries to address the below issues with current cryptocurrency platforms in the following way:

- Transaction times and capacity - by using a revolutionary Unchainet blockchain engine (inspired by Tendermint and the Red Belly blockchain[18]) we will seek to process more than 10,000 TPS (transactions per second) on the current network. As we grow our network (i.e. with a number of high quality nodes), we expect the TPS to increase as well.

- Transaction cost - we intend that the platform to be funded by fees from computer resource trading, so we can offer transactions on the main UNET blockchain for individuals for free (subject to DDoS protection) and would be able to charge low transaction fees for organizations who need bulk processing.

- Energy cost - running the Unchainet blockchain engine is comparable to running a large server application, so that total energy consumption and costs should be negligible in comparison to the consumption and costs of using an existing blockchain platform.

- Decentralization - our network aims to solve the decentralization problem not only on the algorithm layer, but also on a network layer by attempting to evenly distribute voting power among geographic regions, data centers, and providers.

1.4   Decentralized blockchain apps

Unchainet intends to provide a modular blockchain as a service. Clients, startups, and new projects can base their blockchain application on the Unchainet blockchain platform to take advantage of its expected higher transaction speed as well as the flexibility to use their own storage mechanism, consensus algorithm or programming language.

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[14] https://usa.visa.com/run-your-business/small-business-tools/retail.html
[15] https://thenextweb.com/hardfork/2018/02/02/a-brief-history-of-bitcoin-mining-hardware/.
[16] https://digiconomist.net/bitcoin-energy-consumption
[17] https://blockchain.info/pools
[18] http://poseidon.it.usyd.edu.au/~concurrentsystems/rbbc/Benchmark.html

Ethereum, Neo, and Golem seem to have similar goals: to create a worldwide computer to enable decentralized apps. From our perspective, all of them appear to share a large disadvantage: they are creating new, untested technologies for problems that have already been solved, like storage, networking, and computing resource allocation. We believe the best alternative is to use existing, proven open-source technologies (like OpenStack and Kubernetes) and modify them to intersect with the blockchain primarily where payments, contracts and quality score may be involved.

1.5 Note on decentralization

Unchainet expects to provide software for cloud and hosting providers which will allow them to participate in the verified network and rent their computing, storage and network capacity to Unchainet clients. Small amounts of provider capacity would be set aside and used to power the Unchainet network.

We plan for cloud providers on the Unchainet platform to be independent businesses or individuals who meet basic quality criteria. Once qualified, they can participate in the network simply by installing Unchainet software to provision capacity to the network.

Since installing software is voluntary, cloud providers are expected to be individuals and independent businesses incentivized to run the software with high availability, reliability, security, and other favorable performance qualities. Unchainet plans to be a **unique decentralized system based on Proof of Beneficial work ("PoBW")** which will stand (and fall) on high-quality providers.

Many competing blockchain projects only describe their consensus algorithm as a way of ensuring decentralization. They are often quiet about where the nodes of their blockchain are located and who owns them. They might be under the control of a few organizations, or running in a single datacenter, which could put the network in danger. We believe Unchainet's low entry costs, which should ensure a network of independent nodes, and consensus, are both crucial elements for the achievement of network stability and distribution of voting power.[19] Information about the vote distribution across regions, datacenters, and individual providers may be available on the public QoS chain.

2. The Unchainet platform

Unchainet intends to be *the platform* for renting and buying computing resources anywhere in the world with high quality and security standards in mind. It expects to host a fast blockchain designed to support 10,000+ transactions per second used internally for trading computing resources and externally for third-party developers to build decentralized apps.

2.1 Unchainet for Providers

We plan for computing providers to install the Unchainet platform on their hardware. Installation is recommended on bare-metal, but the platform may be installed on virtual machines

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[19] https://cryptovest.com/news/eos-block-producers-who-are-the-21-large-entities-to-secure-the-network/.

in existing environments. Providers can then allocate all or partial resources to be available to the network.

When the initial setup and allocation is completed, providers will receive a unique ID on the network and start collecting reputation (a quality score) which is determined by constant checks from peer nodes. They can monitor availability, network throughput, latency, and also ask for various checksums and puzzle solving to verify that the software running on the node is genuine and has not been tampered with.

When a node consistently delivers good quality, we intend to have it selected into a closed pool of approved nodes which can propose and verify transactions on the network. Presence on the network and higher reputation is planned to provide better returns to providers so they are motivated to maintain the quality of their nodes. Providers will be paid in UNET tokens, which we expect will be traded for any other cryptocurrency or fiat currency when it is listed on a third-party exchange.

2.2 Unchainet for Clients

We plan to provide clients access to the Unchainet web console and CLI, which is similar to existing cloud providers but with a simplified UI for launching new instances.

We believe Unchainet's primary use-case after launch, will be for research, AI training, video rendering and special web services workloads where we aim to provide better pricing and clients expect interruptions when higher bidders enter the market for computing resources. After the launch and collection of sufficient data, the team will focus on making highly reliable instances that match industry standard (99.99%) availability, which can be used for any purpose, including website and mission-critical service hosting.

2.2.1 The compute purchase process

The purchase process is expected to be as follows:

1. The client will log into the Unchainet platform and select a number of resources like CPU, GPU cores, memory and storage

2. Client will select a specific provider, region, or global provider search

3. Client will be presented with options to select availability:

    ● **Eventual availability** - price may fluctuate with supply and demand and a client's instance may be shut down when a higher bidder enters the market. This should be suitable and cost-effective for research, AI training, video rendering, or similar workloads. Clients who are already using AWS spot instances or Google pre-emptible VMs may expect the same behavior but lower prices.

- **Guaranteed availability** - the client will pay per minute of workload - prices are highest of the 3 purchase options but availability will be assured and instances should not be pre-empted or stopped at anytime.

- **Long-term booking** - pre-paid option to book resources for a longer term (1 month to 5 years) with discounts for longer durations.

4. Client will need to purchase the computing resources with UNET tokens which can either be transferred from an existing wallet or purchased in the Unchainet client platform using the most popular cryptocurrencies (e.g., Bitcoin, Ethereum).

5. UNET tokens will be required immediately for a long-term booking or will be continuously spent, in the case of eventual and guaranteed availability purchases. When a client is close to depleting its account holdings, the platform will alert them with information on how much time is left for their workload until it is shut down.

2.2.2 Wallets vs. service accounts

We expect anyone will be able to download the desktop or mobile Unchainet **wallet** and send or receive UNET tokens peer to peer, similar to existing Bitcoin and Ethereum wallets.

Service accounts on the other hand, are like online wallets. Their primary purpose will be to buy computing resources from Unchainet.

Users may withdraw money from a service account unless the amount to be withdrawn had been used to reserve services. They can choose to keep their balances in UNET (which can be volatile), CRC (more on CRC in Chapter 5) or to split holdings in any ratio to minimize the risk and make spending on computational resources more predictable.

2.2.3 Unchainet clients

The cloud services market is predicted to surpass $500b in 2020[20]. Clients using cloud services may include individuals, start-ups, small and medium businesses, enterprises, universities, research facilities, and even governments. While we do not expect governments and mission-critical enterprise applications to migrate to Unchainet from day one, we believe that all other groups will benefit from lower prices and automatic scaling.

We are on a mission to be on par with or to exceed our larger competitors such as AWS, Google, and Microsoft in terms of quality of services, efficiency, ease of use and pricing. While the competitors may be a few years ahead, Unchainet aims to close the gap in a couple of years by providing a reliable platform with core infrastructure and leaving the doors open for other developers to deploy new and existing applications to the Unchainet platform. Clients are expected to benefit from extensive core services, consolidated billing, and identity management.

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[20] https://www.forbes.com/sites/alexkonrad/2015/06/18/byron-deeter-state-of-the-cloud/#66788ac2767c

We believe that a couple of years is not an exaggerated timeframe, as we already have a head start with open-source technologies such as OpenStack and Kubernetes, which were not available ten years ago when cloud services first started.

2.3   Unchainet developers

In the first phase, we plan for the platform to provide basic resource allocation capabilities on the infrastructure as a service (IAAS) and platform as a service (PAAS) levels. Developers and system administrators are expected to book computing, storage, and network resources for a fixed price or by bidding their max price. We intend or developers to easily run single containers, shell scripts, or kubernetes configurations on the Unchainet cloud in a similar way as they do on the existing cloud platforms.

In the second phase, we will plan to add services such as serverless computing, databases as a service, and most interestingly, the Unchainet blockchain service. We then expect developers to be able to use the existing Unchainet blockchain, which is optimized for fast transactions, and create new blockchain applications with:

- Choice of Programming language - most modern languages like C++, Go, JavaScript, Java, .NET, and more

- Choice of Data storage structure - custom designed and optimized storage for a specific problem (few data points for financial transaction vs. structured and indexed data backed by PDF documentation)

- Choice of publicity/anonymization of transactions and permission systems

- Virtually seamless interaction with existing Unchainet wallets and identity services

3.   Business overview

Unchainet's success stands and falls with the economics in cloud and hosting space. A growing number of providers and paying clients are the building blocks of the Unchainet network's value. We expect the software platform will enable various B2B and B2C services to excel, with the quality and reliability of the platform as a value multiplier.

3.1   Business model

Unchainet's primary revenue stream is planned to come from a combination of fees (average 2-5%) and rented computing resources paid by clients. The main estimated expenses are expected to include development, a B2B sales team, and training of a broad network of external consultants to provide technical support and implementations on the Unchainet platform.

Other components are displayed in the Business canvas. (All sections are broken down below for a better overview).

The Business Model Canvas — Designed for UNCHAINET — Designed by Roman M. — Date 31.1.2018 — Iteration 3

Key Partners

Cloud / hosting providers
- key resource – computing, storage, network res.
Investor / venture capitalists
- key activity – funding, network growth, key clients
Cloud enterprise consumers
- building trust in the platform, liquidity of workloads
Blockchain advisors/promoters
- network growth, advertising, PR
Cloud consultants - individuals and agencies
- build on Unchainet cloud and supporting clients

Key Activities

Build liquid market with computing resources
- build network of providers and reserve capacity
- acquire paying clients
Grow the platform
Build and improve open source platform
Support blockchain app ecosystem
Analyse data and improve

Key Resources

Large, global compute & storage network
- true decentralization, incentivised for high quality
Automatic quality control system
- network self-regulating unique QoS chain
Internal team of professionals
- in the cloud and blockchain fields
Consulting network of certified professionals

Value Propositions

For providers:
- income generation
- investment into high growth blockchain company
- supporting open decentralized Internet
- we provide easy to install software for automatic resource allocation and automatic payouts

For clients:
- lower cost of computation resources, high quality
- variety of standard and niche services

- supporting open decentralized Internet

For blockchain businesses
- reliable and modular blockchain platform to raise funds and operate high Tx volume business
- partnerships and funding

For consultants
- steady stream of client work

Customer Relationships

Enterprise account management and support
- internal professionals caring for strategic clients
Certified customer support consultant network
- affordable professionals supporting small clients
Free Training platform
- self-help resources

Channels

Sales to large clients
- highest priority channel for first 2 years
Ads and referrals for small clients
Developer/Consultant network
Cloud & crypto influencers
Emails, notifications to re-activate

Customer Segments

By company size
- enterprise, small
By required service
- research, webhosting, critical workloads
By demographic
- local, global, special regional legislation
By relation
- strategic, invested, long-term, short-term

Cost Structure

Development & expansion
Sales & referral programs
Payroll & contractors
Customer support
Consultant training

Revenue Streams

Clients pay 2-5% fee for resource usage
- 5% for low quality or short presence providers, 2% for high quality
- this is main revenue stream working from early stage
Referral fees for hardware sold to providers
Referral fees from recommended co-location datacenters
Returns from investment into blockchain apps on Unchainet platform
- later phase stream

3.1.1 Key Partners for Unchainet

Cloud / hosting providers: key resource -- computing, storage, network resources.

Investors: key activity -- funding, network growth, key clients

Cloud enterprise consumers: key activity -- building trust in the platform, the liquidity of workloads

Blockchain advisors/promoters: network growth, advertising, PR

Cloud consultants: individuals and agencies -- build on Unchainet cloud and support clients

3.1.2 Key Activities for Unchainet

Building a liquid market with computing resources

- building a network of providers and reserve capacity

- acquiring paying clients

Growing the platform

Building and improving an open source platform

Supporting the blockchain app ecosystem

Analyzing and improving data

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3.1.3 Key Resources for Unchainet

Large global compute & storage network: true decentralization, incentivized for high quality

Automatic quality control system: network self-regulating, unique QoS chain

Internal team of professionals: in the cloud and blockchain fields and business growth

Consulting a network of certified professionals

3.1.4 Value Propositions for Unchainet

For providers

- income generation

- investment into high growth blockchain company

- supporting open decentralized internet

- easy to install software for automatic resource allocation and automatic payouts

For clients

- lower cost of computation resources of higher quality

- variety of standard and niche services

- supporting open decentralized internet

For blockchain businesses

- reliable modular blockchain platform to

- raise funds and to operate high Tx volume business

- partnerships and funding

For consultants

- a steady stream of client work

3.1.5 Customer Relationships for Unchainet

Enterprise account management and support: internal professionals caring for strategic clients

Certified customer support consultant network: affordable professionals supporting small clients

Free Training platform: self-help resources

3.1.6 Channels for Unchainet

Sales to large clients: highest priority channel for the first 2 years

Ads and referrals for small clients

Developer/Consultant network

Cloud & crypto influencers

Emails, notifications to re-activate

3.1.7 Customer Segments for Unchainet

By company size - enterprise, small

By required service - research, web hosting, critical workloads

By demographic - local, global, special regional legislation

By relation - strategic, invested, long-term, short-term

3.1.8 Cost Structure for Unchainet

Platform Development - 40%

Sales & marketing - 35%

Training & support programs (consultant training) - 20%

Admin, Legal & Operations - 10%

3.1.9 Revenue Streams for Unchainet

Clients pay 2-10% fee for resource usage

− up to 10% for low quality or short-term providers, 2% for high quality and long/term providers

− this is the expected main revenue stream working from the early stages

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Referral fees for hardware sold to providers

Referral fees from recommended co-location datacenters

Returns from investment into blockchain apps on Unchainet platform - later phase stream

3.2   Cost & Revenue model

3.2.1   Model computing unit

We have based our modeling on the server unit with 64 virtual CPU cores, 64GB RAM, 400 GB SSD and comparing it with AWS pricing.

Note: All prices are in US dollars. All A WS prices are valid for Sydney region as for 1.10.2018.

AWS reference instance

Instance Type	c4.8xlarge[21]
Configuration	
vCPU	32
RAM (GB)	60
Storage per month (400 GB SSD)	$48[2222]
Spot pricing	
Spot pricing per hour without storage	$0.4907
Spot pricing per month without storage	$353.30
Spot pricing per month - total costs	$401.30[23]
On-demand pricing	
On-demand pricing per hour without storage	$2.0850
On-demand pricing per month without storage	$1,501.20
On-demand pricing per month - total costs	$1,549.20

Unchainet reference instance - refurbished server[24]

Configuration
Refurbished Dell PowerEdge R910 4 x X7560 2.26Ghz 8-CORE 64GB RAM 8x146GB PERC H700 32-CORES

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[21] https://aws.amazon.com/ec2/pricing/on-demand/

[22] https://aws.amazon.com/ebs/pricing/

[23] The data transfer costs were omitted from the modelling as they are either higher or similar on AWS.

[24] Available on eBay.

vCPU	32
RAM (GB)	60[25]
Storage (8 hot plug drives -GB)	1168
Server price	~$3,750.00
Colocation costs	$119[26]

Unchainet reference instance - new server[27]

Configuration		
HP ProLiant DL380 G9 2U Rack Server - 2 x Intel Xeon E5-2670 v3 2.30 GHz28[28] + 400 GB SSD[29]		
vCPU	32	
RAM (GB)	60[30]	
Storage (SAS SSD - GB)	400	
Server price	~$6,650.00	
Colocation costs	$119	

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[25] We expect 4 GB to be reserved for Unchainet software.

[26] haps ://www. serversaustralia. com. au/colocation-australia.ph

[27] Available on eBay.

[28] https://www.newegg.com/Product/Product.aspx?Item=N82E16859108637

[29] https://www.newegg.com/Product/Product.aspx?Item=9SIAA0T6PK1147

[30] We expect 4 GB to be reserved for Unchainet software.

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3.2.2   Monthly revenue forecast

Cost & Income comparison for reference Unchainet instance

Availability Type	Monthly costs for AWS Reference Instance	Gross income[31] (paid by client to Unchainet)	Monthly colocation costs
Spot Instances (Min revenue)[32]	$401.30	$361	$119
On-Demand (Max revenue)	$1,549.20	$1,394	$119

Approximate average returns (10% spot, 80% on-demand, 10% long-term)		$1,260	$119

Our view of typical revenue scenarios for reference Unchainet instance / average Quality Score 60 (i.e. Unchainet fee 5%)

Availability Type	Monthly Provider Net Income	Unchainet income
Spot Instances (Min revenue)	$224	$18
On-Demand (Max revenue)	$1,206	$70
Approximate average returns (10% spot, 80% on-demand, 10% long-term)	$1,078	$63

Unchainet income for number of cores - for Quality score 60 (i.e. Unchainet fee 5%)

Availability Type	Number of cores (vCPU)		
	1000	100000	1000000
Spot Instances (Min revenue)	$5,643	$56,433	$564,334
On-Demand (Max revenue)	$21,786	$217,856	$2,178,563

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[31] We expect 4 GB to be reserved for Unchainet software.

[32] Spot instances are the least expensive computational resources which means they will generate minimal revenue

Approximate average returns (10% spot, 80% on-demand, 10% long-	$19,687	$196,873	$1,968,727

**Payback period in months for providers - for Quality score 60
(i.e. Unchainet fee 5%)**

Availability Type	Refurbished instance	New Instance
Spot Instances (Min revenue)	17	30
On-Demand (Max revenue)	3	6
Approximate average returns (40% spot, 40% on-demand, 20% long-term)	5	9

3.2.3   Cost & Revenue forecast

|	2018	2019	2020	2021
Development costs *	$600,000	$1,600,000	$3,400,000	$5,800,000
Sales & marketing costs *	$270,000	$2,000,000	$4,200,000	$6,600,000
Training & support costs *	$200,000	$400,000	$800,000	$1,200,000
Other costs (15% overhead)	$160,500	$600,000	$1,260,000	$2,040,000
Total costs	$1,230,500	$4,600,000	$9,660,000	$15,640,000
Estimated CPU cores in use ****	2000	40000	250000	1000000
Sales revenue	$47,249	$944,989	$5,906,181	$23,624,726
Profit/Loss	-$1,183,251	-$3,655,011	-$3,753,819	$7,984,726

Estimated average developer salary $120,000 pa.

*** Estimated average sales professional salary $120,000 pa. This may vary greatly based on region*

**** Estimated investment in learning materials and in training staff*

**** AWS was estimated to have 2M servers (64M cores in 2014) -*

https://www.bloomberg.com/news/2014-11-14/5-numbers-that-illustrate-the-mind-bending-size-of-amazon-s-cloud.html Our estimates seem relatively conservative compared to AWS and are based on the number of sales professionals and growing maturity of the platform
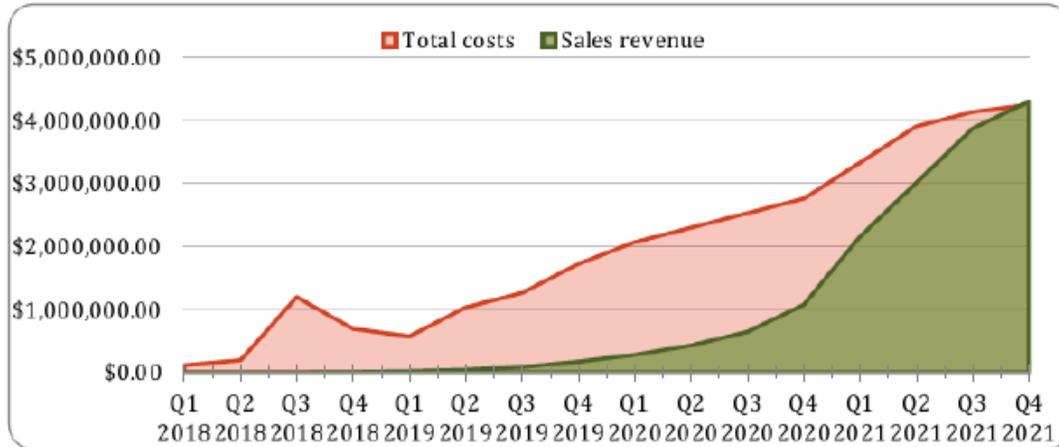
3.3 Competitor Analysis

We have researched several decentralized cloud, storage and supercomputer competitors in the field. It appears to us that such competitors all fit in the *decentralized cloud* bucket, but also that each addresses the market differently.

The majority of the competitors we have researched so far create proprietary platforms, which are extremely hard to migrate for clients. Unchainet will look to focus on open source technologies like containers and Kubernetes and provides bridging interfaces into existing cloud platform APIs.

Most of the competing projects we have researched offer web site hosting, CDN, video streaming, etc. from the beginning, but none of them clearly explains how they match the 99.99% availability compared to established cloud platforms.

Another weak selling point that we have gleaned from these competitors is they appear to allow connection of mobile phones, gaming systems and laptops into the network without a node quality monitoring system. Based on our observations, this appears to be a sub-par offering for the majority of cloud clients and makes 99.99% availability and high internet speeds close to impossible.

Unchainet will focus on the niche cloud market called the "spot pricing market" in the early phase. We plan for clients who want to run their research, AI training, rendering or other workloads to bid the price they are willing to pay for the required amount of computing power and then run their workloads until a higher bidder comes in.

We believe their workloads are already optimized for dropouts so our offering is expected to be a 100% fit for their needs. We have also identified and want to partner with several "Cloud cost optimization" companies. These companies are focused on optimizing website hosting costs across all cloud platforms for their clients and appear willing to connect to our network, which would make them an excellent reseller partner.

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	Golem golem.net work	Substratum substratum.net	Theta thetatoken.org	SONM sonm.com	Dadi dadi.cloud	UNCHAINET unchainet.com
Niche market	worldwide supercomputer	decentralized web	Online video streaming	Supercomputer Organized by Network Mining	Web services	Spot & on-demand infrastructure
Native blockchain	no	No	yes	no	yes	yes
Provider quality checking (reputation)	no	No	Yes	no	no	yes
Supporting existing client workloads	no	No	No	no	yes (Docker)	yes (Docker & Kubernetes)
Extra Features						easy migration from AWS, Azure, GC.
						Support for mission critical workloads
						Network transparency (keeping privacy)

3.3.1 Unchainet's Differentiation

Unchainet aims to provide a distributed cloud platform with QoS chain technology that will control the quality of individual providers and also should reward them based on the quality of their offering. Our unique positioning is expected to be in the "spot pricing infrastructure" cloud niche which has become increasingly popular and is where we believe we can guarantee great availability even for mission-critical workloads on our high-quality nodes. Having access to the wide network with real economy is expected to provide us a unique opportunity to create a fast, free and truly decentralized blockchain platform that will enable a new breed of blockchain dApps.

4. Technical overview

This section describes the technical solution of the Unchainet platform and its main components:

- Cloud services

    - IAAS/PAAS (Infrastructure as a Service/Platform as a Service)

    - Additional services (CDN, serverless computing, and databases)

    - B2C services (website hosting, mobile backend)

- Blockchain services

- QoS chain

- UNET chain

- blockchain as a service and first computing rental blockchain app

Introducing QoS Chain; automated quality control of cloud providers

We plan for the Unchainet network's reliability to be determined by **QoS Chain** (Quality of Service chain); a blockchain where nodes periodically check on each other to make sure clients are paying for expected quality and that only reliable cloud providers have "votes" to confirm transactions.

4.1.1   Quality parameters

The formula to determine quality should work with multiple inputs and return a quality score. It is expected to check **technical parameters** of the node:

- Compute type and capacity

- Storage type and capacity

- Network throughput

- Reliability of service

- Security

and should compare claimed values by providers with real values measured by peers.

The quality score is planned to range from 0 to 100.

Another factor would be **uptime at a consistent quality level**, which means that the time period providers are consistently online without outages and during which period their reported values correspond to peer-measured values.

Verified business registration - Verified businesses are considered higher quality as there is less risk of clients working with a hacker organization with malicious intent. Anonymous individuals will have lower scores and therefore lower chance to have a "vote." However, long-term quality in other parameters will make business registration less important.

Adding only **correct transactions.** If a node adds only transactions which are later recognized as correct by consensus of votes, it will achieve a higher score than a node which tries to confirm transactions that are refused by the majority.

Ad Hoc checksums. The reported version of the Unchainet software needs to be consistent with expected checksums. Checksums are hash functions which are calculated on different levels

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(container, host OS, storage, in memory) and can be added dynamically to keep on top of possible malicious versions.

4.1.2 Quality rating process

We generally plan to reward nodes for:

- being consistently online, without outages

- being honest about provided capacity/throughput

- being honest about business registration

- not adding transactions which are inconsistent with the majority of nodes

- Having ad hoc checksums always right

Unchainet plans to penalize nodes which break the rules and may remove their "vote" if their quality score drops below the threshold.

The quality score will determine how many "votes" a given provider has, or technically how many nodes the provider can connect to the Unchainet blockchain network.

The number of nodes a provider contributes is zero after registration and is only added some time (weeks or months) after reaching the quality threshold.

We expect to grant extra rewards to providers on top of the basic hosting reward for maintaining a high-quality score and for having voting power.

4.1.3 Participant and Voter lists

Quality should be determined automatically by periodic QoS chain checks. These checks can be used to frequently update the **Blockchain Participant List** by identifying and removing low-quality and malicious nodes from the consensus in order to achieve and keep high transaction speed and security. The list contains public keys of all participating nodes, so all communication between nodes can be verified, and votes can then be trusted.

While the Participant List can be large and include all high-quality nodes on the network, we also keep a **Blockchain Voter List** which is the core list of currently active nodes participating in the consensus. The number of active nodes is planned to be in a sweet spot for both widespread decentralization and transaction speed. Keeping all nodes active would slow down the commit (block) time, while having fewer nodes could be perceived as the accumulation of too much voting power in too few hands.

This is an improved version of Tendermint validators[33] where we introduce automatic active node management to achieve geographical spread, provider neutrality, and optimal node capacity.

4.2   The main "UNET" chain

The main Unchainet blockchain has a single purpose - to aim to transfer UNET tokens between offline wallets and web accounts quickly, securely, and without cost.

Our blockchain platform is inspired by Tendermint blockchain[34], Hyperledger Fabric, and Red Belly Blockchain technologies which made great progress on on-chain transaction speed.

Tendermint provides us a way to create a modular blockchain technology and to introduce new consensus algorithms based on Quality of Service and Proof of Beneficial Work. We also think modular storage is essential for modern blockchain apps, so they can be optimized for speed based on business requirements. This will be an essential technology to provide our Blockchain as a service offering.

UNET chain, after a wide network adoption, is expected to run on at least 500 geographically distributed nodes (ideally over 1,000) participating in consensus and on at least 10k backup nodes which have full transaction history and can immediately take over a voting role. That is 2x-4x greater than the proposed Ethereum Casper update which is limited at 256 nodes without further thought of geographical node distribution.[35]

Tendermint and Red Belly blockchain implementations do not have an upper limit for number of validators (deciders) and were tested with 300+ nodes[36] [37]

UNET transactions are planned to be anonymous by default, using a zero-proof algorithm, but the sender can include watchers (which can be a specific ID or public) who can identify participants and numbers of transactions. This will allow advanced use cases like transparent accounts.

Transactions are expected to be free. Proof of Beneficial Work (PoBW) is a variation of the BFT (Byzantine Fault Tolerance) algorithm with emphasis on high quality nodes and even geographical distribution, which doesn't require high computing power to verify transactions. Costs required to verify transactions are intended to be covered from Unchainet resource rental fees. Several limitations will be imposed on individual transactions to avoid DDoS attacks on the network. Bulk transactions will be possible as a special type of transaction - this, however, will be paid (mostly for large payment processors - costs should be orders of magnitude smaller than current Bitcoin or Ethereum fees).

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[33] https://github.com/tendermint/tendermint/wiki/Validators

[34] https://github.com/tendermint

[35] https://www. reddit.com/r/ethereum/comments/42ufc0/casper_162_node_limit_pos_pools/

[36] https://blog.cosmos.network/consensus-compare-tendermint-bft-vs-eos-dpos-46c5bca7204b

[37] https://www.ccn.com/university-sydneys-red-belly-blockchain-scales-660000-transactionssec/

Transaction speeds - Tendermint implementation with Proof of Stake is capable of several thousand transactions per second. We are inspired by the work of Red Belly blockchain which claims to achieve 660,000 Tx/s on a limited number of nodes.[28] The chart below shows that with known algorithms, numbers of nodes negatively affect blockchain performance. Our goal is to refine our algorithm and parameters to achieve at least 10,000 Tx/s with a 3-second latency and at least 500 geographically distributed voting nodes to serve as a fast, reliable and trusted network for microtransactions.

node scalability
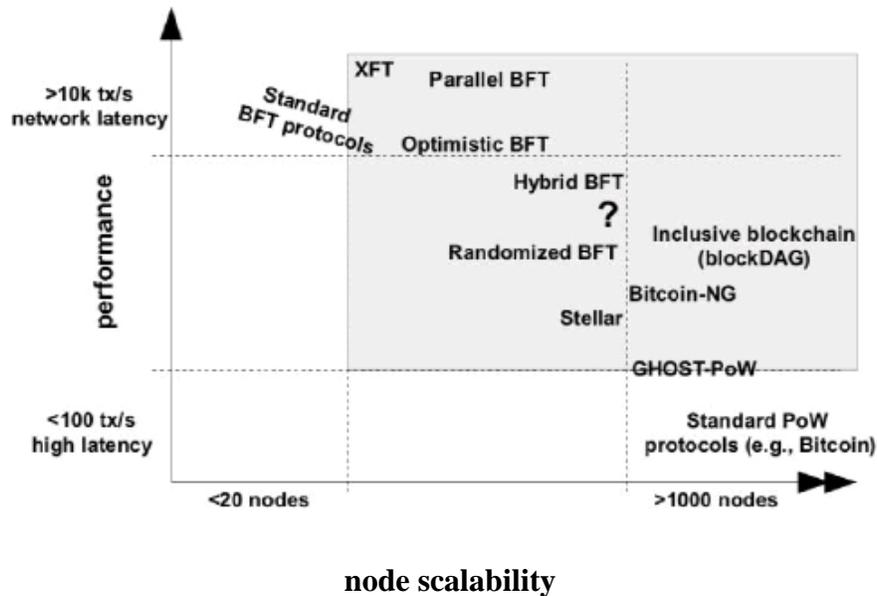
Chart - Consensus algorithms - decentralization vs. speed[38].

4.2.1   Consensus algorithm - Proof of Beneficial Work (PoBW)

The consensus algorithm for the Unchainet main chain is called Proof of Beneficial Work which is based on the BFT (Byzantine fault tolerance) algorithm, while trustworthiness of individual nodes is intended to be validated by the underlying concept of Quality of Service chain which defines which nodes are trusted and currently participating in voting. Querying the QoS chain is fast, so in cases of malicious behavior or connection dropouts of some nodes, the QoS chain is responsible for updating participant and voter lists quickly, so the main chain will not be blocked.

The Unchainet blockchain will be public. That means everyone can install and download the full blockchain. However, transactions will be anonymous, so only public transactions or transactions where users are owners or watchers can be viewed.

While reading from the blockchain is available for everyone, participating in the consensus process will require time and quality of service to get on the Blockchain Participant List as described in the QoS section.

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[38] https://allquantor.at/blockchainbib/pdf/vukolic2015quest.pdf

	PoW consensus	BFT consensus
Node identity management	**open, entirely decentralized**	permissioned, nodes need to know IDs of all other nodes
Consensus finality	no	**yes**
Scalability (no. of nodes)	**excellent (thousands of nodes)**	limited, not well explored (tested only up to $n \leq 20$ nodes)
Scalability (no. of clients)	**excellent (thousands of clients)**	**excellent (thousands of clients)**
Performance (throughput)	limited (due to possible of chain forks)	**excellent (tens of thousands tx/sec)**
Performance (latency)	high latency (due to multi-block confirmations)	**excellent (matches network latency)**
Power consumption	very poor (PoW wastes energy)	**good**
Tolerated power of an adversary	$\leq 25\%$ computing power	$\leq 33\%$ voting power
Network synchrony assumptions	physical clock timestamps (e.g., for block validity)	**none for consensus safety** (synchrony needed for liveness)
Correctness proofs	no	**yes**

Table - a comparison of PoW algorithm (used in Bitcoin and Ethereum) and BFT[39].

4.2.2   Proof of beneficial work and Sybil attacks[40]

Assuming Unchainet has at some point 10,000 CPU cores as processing power and it runs 1,000 voting nodes (1/10 ratio) and it takes about 1 month of high-quality service (non-interrupted, high throughput network) to obtain voting power, an attacker probably would have to connect at least 5,000 CPUs to the network in several geographical locations for a period of more than 1 month to put the network in danger. (⅓ of byzantine nodes - 5000/15000), which probably would be too high a cost to be profitable or to DDoS the network.

4.3   Computing Rental Blockchain App

While the UNET chain is a generic payments blockchain, we will need a specific blockchain app which lists available resources and maintains an order book with records of resources and current ownership.

Records (or contracts) describe:

- Resource availability - long-term, guaranteed, eventual (explained in "Unchainet for clients") and guarantees access to the specific pool of resources to the client.

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[39] https://allquantor.at/blockchainbib/pdf/vukolic2015quest.pdf
[40] https://en.wikipedia.org/wiki/Sybil attack

- Resource location - can be very generic, like 10 CPU cores anywhere in the world) or specific - 10 CPU cores from a specific provider in the specific datacenter.

- Conditions - like enough balance on client's service account or high enough bid to overcome counter-bidders.

- Resource minimum quality score - clients choose a minimum quality score which affects price but also provides better service. If a specific resource loses quality, it will be replaced, or the client is refunded.

The rental blockchain app will be a reference implementation of a modular blockchain app on the platform and should feature:

- Fast and free transactions

- Custom-built backend to store information about contracts

- Anonymous transaction participants, but public amounts (allowing transparency and network growth auditing)

4.4 General Blockchain Apps (decentralized apps, dApps)

In the second phase, we expect to open our blockchain platform for developers to build custom blockchain apps. Blockchain apps will generally consist of these components:

- **Consensus algorithm** - By default a PoBW backed by Unchainet providers but can be complemented or completely changed by specific "strategic nodes" with extra privileges. (For example, a blockchain application serving as a source of truth of asset ownership might choose asset producers to have a special vote when adding assets to the blockchain)

- **Transaction anonymity** - choice of public, anonymous, hybrid (some information is public), auditable by specific 3rd party etc.

- **Transaction costs** - developers can choose if they want to charge fees for every transaction or keep them free.

Our goal when designing a modular blockchain is to free developers to write their code in any language, but to create a platform with boundaries and checks. Users and auditors can then verify the code and make an informed decision if the app is trustworthy.

4.4.1 Example blockchain apps: Comparing Ethereum and Unchainet platform

The Ethereum network introduced a revolutionary smart contract concept which allows processing of program code on the blockchain. There may be limitations imposed by transaction

speed and costs though. There also may be a limitation in using custom programming languages.[41]

Here we present some examples of simple escrow contracts and how existing well-known apps such as UBER (which would be a great candidate for decentralization) might work on Ethereum and Unchainet networks:

4.4.2   Escrow

Ethereum[42]

(example of the cost of a real world Ethereum contract):

User deposits 0.5 Ether - cost $3.21 at $300/ETH

Sender confirms - $0.28 at $300/ETH

Arbitrator confirms and 0.5 is released to recipient - $0.49 at $300/ETH

Time to send initial ether to smart contract can take around 15 minutes and sending 2 consecutive messages will take a few seconds. The release of the funds to the recipient can take another 15 minutes - so this is a pretty good outcome for a simple smart contract.

Unchainet

User Deposits $150 equivalent in UNET (unchainet token) - free, 1-3 seconds Sender confirms - free - sub second

Arbitrator confirms - free (small fee if Arbitrator runs a business and confirms many transactions a day), time 1-3 seconds to deliver the funds to the recipient.

Total costs and time on Ethereum network: $3.98, time around 30 minutes

Total costs and time on Unchainet network: $0.001, time around 3 - 8 seconds

4.4.2.1. Decentralized Uber - simplified for the purpose of the example

Ethereum[43]

(there is no real example to refer to estimated costs and time taken from http s://ethgas station.info/

We assume $0.3 and 10 seconds for average transaction which just sends a message and doesn't move Ether (money))

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[41] https://github.com/ethereum/wiki/wiki/Programming-languages-intro.
[42] https://hackernoon.com/costs-of-a-real-world-ethereum-contract-2033511b3214
[43] https://ethgasstation.info/

As a driver

- registration - $0.3 and 10 s

- update position every 5 seconds - $0.3 and 10s

- accept job - $0.3 and 10s

- get paid - $0 and 10s

As a user

- sign up to the app - $0.3 and 10 s

- search driver database with the location, update every 5 seconds (impossible in a scalable way to implement on Ethereum network so most probably has to be off-chain) - $0.3 and 10 s if on chain

- accept driver - $0.3 and 10 s

- pay driver -- $1 and 15 minutes

- leave review - $0.3 and 10 s

Unchainet

All mentioned transactions above are free. As a driver

- registration - if the DU app uses Unchainet identity service, it takes 1-3 seconds to receive a time-based token which is valid only for DU app for a limited time.

- update position, accept job - these transactions are off the Unchainet blockchain and are managed by the app itself while using authentication service from Unchainet network. (This is optional for the app - it can use another login service)

As a user

- sign up to the app - 1-3 seconds - user receives a time-based token to communicate further with the app

- search driver database, accept driver, leave review - sub second as it uses off-chain service - pay driver - 1-3 seconds

In this example, it appears that the Ethereum network is hardly capable of the processing needs of a massively scaled app such as Uber while the Unchainet network is designed specifically to work efficiently and securely with just such an app.

4.5   Development phases

4.5.1   First phase

The Unchainet platform is currently running as a pilot with selected clients and permits custom workloads to run on OS or container level.

This marks the beginning of the first phase of the platform.

Our goal in the first phase is to open the platform for everyday clients and to create easy to install software for providers to connect their hardware to the network.

Features:

IAAS/PAAS - fully implemented - allowing clients to book resources as they are used to on competing platforms while running compatible containerized workloads.

Additional cloud services - in development

At this stage **UNET tokens** are based on the Ethereum platform, and CRC coins are kept in an internal centralized database.

QoS chain is in the prototype phase and is largely complemented by manual checks which help to tune the chain to be an autonomous quality control system.

Unchainet main blockchain is in development or running on test networks.

Computing rental blockchain app is in development and a centralized solution is temporarily used.

4.5.2   Second phase

We believe the second phase will mark a significant milestone in platform development. Features:

Additional cloud services like serverless computing and databases are running, B2C services are tested with a few selected partners.

QoS chain is fully working, secure, and modular enough to add ad-hoc tests and remove non-performing and easy-to-work-around tests.

UNET chain

– secure, well tested with best penetration testers and bounty programs.

– fast, performance tested with minimum 10k Tx/s and sub-5-second commit time.

First blockchain app - computing resource allocation will be fully moved from the centralized solution to the blockchain, which will bring transparency to the platform. The first blockchain

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app will be open source and should be a great starting guide for developers to create their blockchain apps on the Unchainet platform.

4.5.3 Third phase

This phase is not well defined on our development roadmap. On the business timeline it can be characterized as a period when we start training an external consultant network to help build on and migrate customers to the Unchainet platform.

Businesses will build on **Unchainet infrastructure,** either with their own teams or by hiring certified consultants.

UNET payment solution will be able to integrate with several businesses requiring fast microtransactions.

Blockchain startups will be able to build their solution and funding on the Unchainet platform.

5. Token issuance

5.1 UNET Tokens (UNETs)

UNET tokens are ERC20 standard tokens, which we intend to create in order to facilitate compute resource trading on the Unchainet platform. After launching our proprietary blockchain main network, ERC20 tokens will be migrated in a 1:1 ratio to the Unchainet blockchain platform.

Unchainet intends to organize an offering of future tokens under a Simple Agreement for Future Tokens ("SAFT" or "Agreement"). The offering will be of SAFTs for the future issuance and delivery of 67%, or 134,000,000 of the total 200,000,000 UNET tokens for an aggregate of US**$18,000,000.** No further tokens will be generated beyond 200,000,000 UNET's.

The base price for the ICO is expected to be **$1 USD = 4.35 UNET, 1 UNET = $0.23 USD.**

5.2 Seed Round

We have organized a seed round for the future sale of UNET tokens under the SAFT. We intend to raise $1,500,000 in the seed round which started on May 24, 2018 and will end when our goal is reached.

5.3 Private Sale

Our next offering will begin when the seed round is fully funded. The private sale will be conducted through AmerX, a New York City- based registered broker-dealer. Private sale dates and process will be announced on the https://www.unchainet.com website.

5.4 Token Distribution

The chart describes the intended token distribution. 67% of the tokens will be offered under the SAFT offering while the rest will be retained in the company for future growth, team, advisors

and partners. Tokens allocated for the team will be under a graded vesting plan for 30 months with 20% of total holdings released every 6 months.
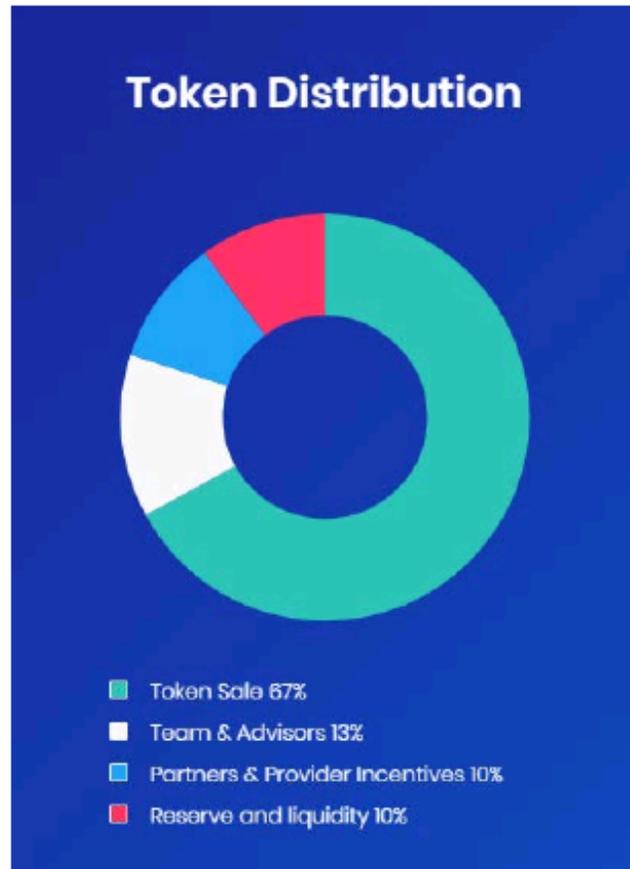
5.5   CRC credits

We will also introduce a credit called CRC (computing resource credit). CRC value will be pegged to the current market value of one-hour rental of our reference instance machine (32 CPU cores, 64GB RAM, 512GB SSD) on guaranteed availability (approximate value of 1 CRC = $1.6 USD).

CRC credits should be:

–   internal to the Unchainet platform

–   locked to a specific service account

–   NOT transferable.

Their only purpose will be to be exchanged for computation resources. Then CRC credits can then be exchanged back to UNETs and paid out to providers.

We believe the below are some of the reasons we need to introduce this credit:

1.   We don't want clients to be exposed to volatility which is common with cryptocurrencies. CRC credits will be expected to represent the concrete value of computing resources and is closer to fiat currency trends. We believe this will facilitate long-term compute budgeting capabilities for our clients.

2.   We need a non-transferable credit to use as an incentive for startups and blockchain projects to run on the Unchainet platform. CRCs may be gifted to a specific account; however, it must be used on the Unchainet platform.

5.6   UNET and CRC comparison

	UNET	CRC
Can be held in offline wallet	YES	NO
Can be withdrawn and traded	YES	NO
Can be held in service account	YES	YES
Exposed to market volatility	YES	NO

6.   Summary

There appears to be a huge and growing demand for cloud services. Currently, there are only a few major cloud providers who dominate the field, but there are many providers who are on par with quality and offer a better price.[44]

There is also a growing demand for a decentralized platform which allows for fast transactions and is not controlled by large corporations.[45]

Unchainet is focused on connecting these two fields by providing a blockchain-governed cloud platform, in order to connect thousands of existing and emerging datacenters with big clients and to attempt to run a blockchain platform capable of running 10,000+ transactions per second (more than Visa). The current market capitalization of cloud and hosting services is about $250 billion and is predicted to double by 2020.[46] The market capitalization of cryptocurrencies is $250 billion and growing (Aug 2018).[47]

We believe that efficiently networking individuals and small and medium-size businesses in a manner governed by a blockchain and Proof of Beneficial Work algorithms will outperform the existing oligopoly of large cloud players.

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[44] https://www.packet.net/compare/aws/.

[45] https://www.cio.com/article/3096994/outsourcing/blockchain-will-drive-demand-for-decentralized-apps.html.

[46] https://www.forbes.com/sites/alexkonrad/2015/06/18/byron-deeter-state-of-the-cloud/#582c68b0767c.

[47] https://coinmarketcap.com/.

The Unchainet platform is expected to allow small businesses and individuals to start AirBnb-like business with their own small data center, with very low barriers to entry. We believe it will support a hyper-scale, fast and free blockchain network which will revolutionize everyday payments and will become the de facto platform for decentralized businesses and applications.

CAUTIONARY NOTE ON FORWARD-LOOKING STATEMENTS

All statements contained in this whitepaper, statements made in press releases or in any place accessible by the public and oral statements that may be made by the Company or its directors, executive officers, employees or agents acting on its behalf, that are not statements of historical fact, constitute "forward-looking statements". Some of these statements can be identified by forward-looking terms such as "aim", "can", "intend," "focus," "target", "anticipate", "believe", "could", "estimate", "expect", "if", "intend", "may", "plan", "possible", "probable", "project", "should", "would", "will" or other similar terms. However, these terms are not the exclusive means of identifying forward-looking statements. All statements regarding the Company's financial position, business strategies, plans and prospects and the future prospects of the industry which the Company is in are forward-looking statements. These forward-looking statements, including but not limited to statements as to the Company's revenue and profitability, prospects, future plans, other expected industry trends and other matters discussed in this whitepaper regarding the Company are matters that are not historic facts, but only possible predictions.

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(a)   possible changes in political, social, economic and stock or cryptocurrency market conditions, and the regulatory environment in the countries in which the Company may conduct its respective businesses and operations;

(b)   the risk that the Company may be unable to execute or implement its business strategy and future plans;

(c)   possible changes in interest rates and exchange rates of fiat currencies and cryptocurrencies;

(d)   possible changes in the anticipated growth strategies and expected internal growth of the Company;

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(f)   possible changes in the availability and/or salaries of employees who are required for the Company to operate its business and operations;

(g)   possible changes in preferences of potential customers of the Company;

(h)   possible changes in competitive conditions under which the Company operate, and in the ability of the Company to compete under such conditions;

(i)   possible changes in the future capital needs of the Company and the availability of financing and capital to fund such needs;

(j)   possible war or acts of international or domestic terrorism;

(k)   possible occurrences of catastrophic events, natural disasters and "acts of God" that affect the businesses and/or operations of the Company;

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Prospective purchasers of the Company tokens (as referred to in this whitepaper) should carefully consider and evaluate all potential risks and uncertainties associated with the Company and its businesses and operations, the Company tokens and the sale of the Company tokens, and all potential risks, uncertainties and other information set out in the PPM, the Agreement, and this whitepaper, prior to any potential purchase of the Company tokens. If any of such risks and uncertainties develops into actual events, the business, financial condition, results of operations and prospects of the Company could be materially and adversely affected. In such cases, you may lose all or part of the value of the Company tokens. For any assistance on the assessment of such risks, you are invited to consult your legal, financial, tax or other professional advisors.

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This whitepaper includes market and industry information and forecasts that may have been obtained from internal surveys, reports and studies, where appropriate, as well as market research, publicly available information and industry publications. Such surveys, reports, studies, market research, publicly available information and publications generally may state that the information that they contain has been obtained from sources believed to be reliable, but there can be no assurance as to the accuracy or completeness of such included information.

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To facilitate a better understanding of the Company tokens that may be offered for purchase by the Distributor, and the businesses and operations of the Company, certain technical terms and abbreviations, as well as, in certain instances, their descriptions, may have been used in this whitepaper. These descriptions and assigned meanings should not be treated as being definitive of their meanings and may not correspond to standard industry meanings or usage.

Words importing the singular shall, where applicable, include the plural and vice versa and words importing the masculine gender shall, where applicable, include the feminine and neuter genders and vice versa. References to persons shall include corporations and other business organizations.

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