GRUAD CYBERSPACE

WHITEPAPER V.1.0

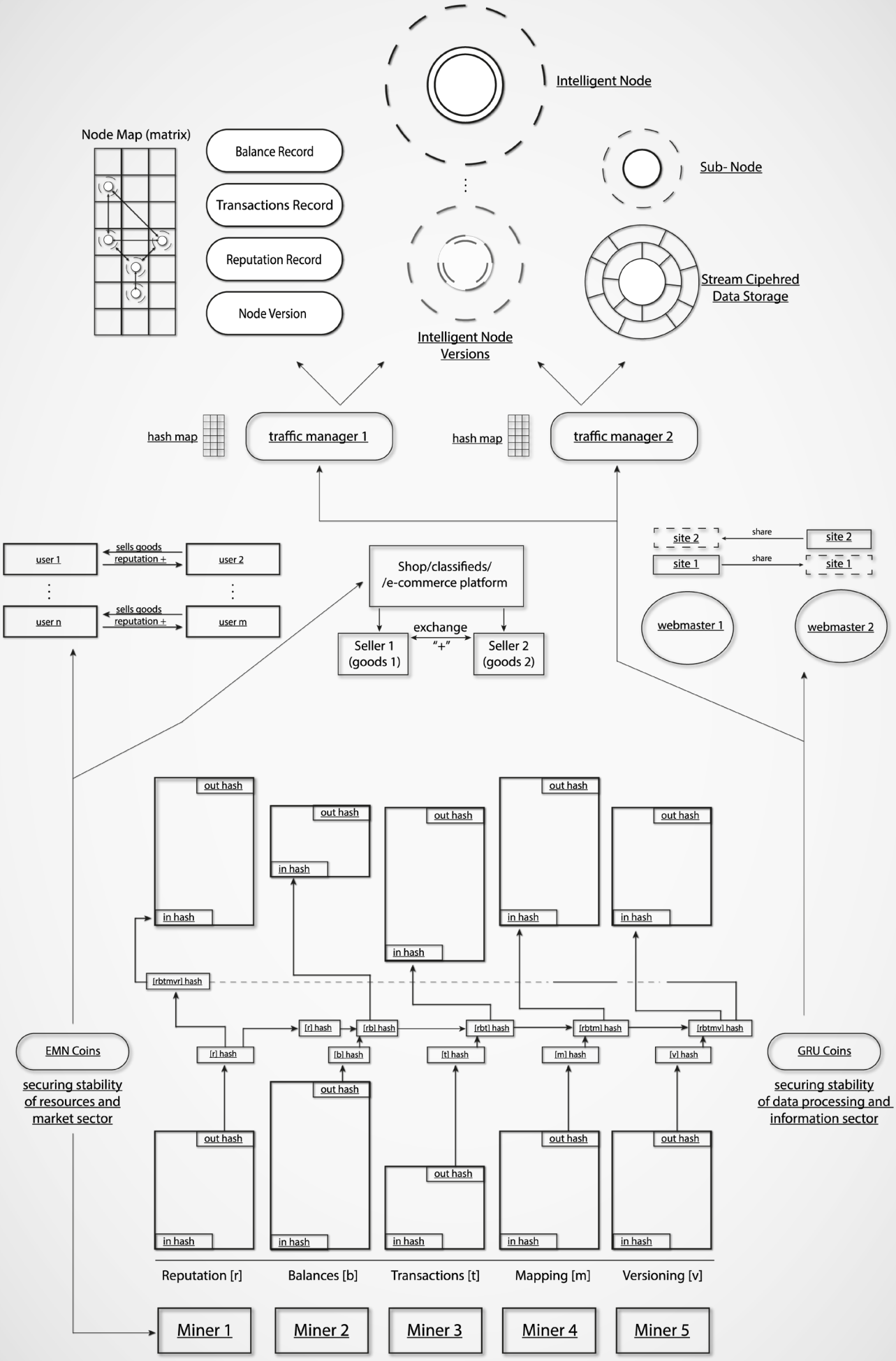
Abstract.
New technologies influence development of our society as they affect us everyday. It's always a constant process of tools invention and their improvement and in the right hands they make world a better place.
Internet became such a tool and we cannot imagine our life without it.

Originally offered decentralized structure of Internet with nodes connected with each other on the network exchanging and storing data went though the commercial route and the logical model of World Wide Web grew into centralized global network where users depend on the third parties and models logic. It carried competitive standards instead of scientific approach, principles of collaboration and collective intelligence. The information is often manipulated by third parties and news agencies, those who are responsible for data and information sharing and distribution compete with each other over traffic and revenue. Those who sell or offer services are often dishonest in terms of "dream products" they offer.

Current models logical structure dictates its rules for every end user.

But now, as another great invention with new set of principles of transparency and privacy, we know as Blockchain, spreads through the world and revolutionizes industries, it became possible to revive the idea of decentralized cyberspace, a new model that is needed and is offered and described in this document.

New decentralized model of cyberspace, named "Gruad Cyberspace" where information is not distorted and has no barriers, the personal space of one is protected from negative intrusions, openness and honesty in trade and services are encouraged, giving much more satisfaction to the returning customers, the system that can sustain itself and it's users even with no fiat currencies involved, based on the balance of social and resources sectors, the platform of the future that is based on principles of collective intelligence and collaboration.


Intelligent Node
Sub- Node
Stream Cipehred Data Storage
Node Map (matrix)
Balance Record
Transactions Record
Reputation Record
Node Version
Intelligent Node Versions
hash map
traffic manager 1
hash map
traffic manager 2
user 1
sells goods reputation +
user 2
user n
sells goods reputation +
user m
Shop/classifieds/ /e-commerce platform
exchange "+"
Seller 1 (goods 1)
Seller 2 (goods 2)
site 2
share
site 2
site 1
share
site 1
webmaster 1
webmaster 2
out hash
in hash
[rbtmvr] hash
[r] hash
[rb] hash
[rbt] hash
[rbtm] hash
[rbtmv] hash
[b] hash
[t] hash
[m] hash
[v] hash
EMN Coins
securing stability of resources and market sector
GRU Coins
securing stability of data processing and information sector
Reputation [r]
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Miner 1
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Miner 4
Miner 5

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1. INTRODUCTION

Technological inventions build our history and develop human society and society's shape depends on how certain technologies affect our everyday life.

The Internet became greatest tool in shaping the society, changing the lifestyle, forming whole new cultures. It changed our lives forever. We cannot imagine the world without it.

Originally Internet was planned and proposed as decentralized structure with nodes connecting to the network, and so was its physical structure, exchanging and storing data, but gradually with commercial approach it went through dependencies of third parties and centralization of traffic and data, with expansion of logical structure and protocols of the adopted model of World Wide Web that created competition among individuals instead of collaboration, control of information over geographical borders and manipulation by some media agencies for their profit, creating disputes among great minds, leading to confusion and conflicts instead of uniting them, the honesty of sellers and quality of marketed "dream products" suffer greatly, webmasters create large amounts of alike content to generate more traffic to their resources to attract visitors and compete with each other producing a lot of redundant data and waste of traffic to market goods or services.

The current models structure dictates its rules to every end user.

The new model with entirely new logical structure is needed, based on idea of decentralization, principles of information freedom, collaboration instead of competition, honesty rewarding instead of lies and dishonesty, with integrated solutions to majority of today's common problems in cyberspace, data and traffic management, cost effective easy and practical backup solutions for every user and flexible content licensing options.

As we know from our history nothing is perfect, every new generation tries to improve the technologies, tools and approaches of previous. Such new approach was the invention of the Blockchain and it became revolutionary breakthrough which started reshaping not only the ways we communicate, do business and how our whole lifestyle is affected, but also our vision of how this should be done with principles of decentralization, reliability and transparency. And due to idea spreading and acceptance, development of new cyberspace became possible, and it is offered and described in this whitepaper.

It is now possible to restore and revive the idea of a decentralized cyberspace model where information is not distorted and has no barriers, the personal space of one is protected from negative intrusions with extra security, openness and honesty in trade and services are encouraged, giving much more satisfaction to the returning customers, and system that can sustain itself and its users.

The model is designed in such a way that it balances the social and the resources sectors, producing direct mutual settlement based on percentages of information being processed and power consumed. Has more secured and "greener" approach that minimizes competition between miners and hardware developers.

It uses its own technology based on the principles of the Blockchain called GMatrix, allowing faster more flexible blocks, higher security and faster processing logic. The system integrates and uses "Intelligent Nodes" and "Traffic Managers", has secure decentralized structure, intelligent algorithms and VR capabilities for full user experience.

2. OUR MISSION

Our mission is to build decentralized self-sustainable "green", intelligent and intuitive digital world with informational and financial freedom, where collaboration and honesty are rewarded instead of competition and lies. The world of balance between social and resources sectors based on self-sustainable economics, improving life and services quality, trade in poor regions and aiming for allocation of renewable energy sources worldwide for further development to mining solutions and solving complex mathematical and scientific algorithms and data processing. The system that can sustain itself with no fiat currencies involved in the future and that will give privacy and freedom of data and information back to its users.

3. PROBLEMS GRUAD MODEL IS AIMED TO SOLVE

Of course there are much more problems than can be seen at first, but we will cover the major ones in this white-paper.

3.1 Current Internet and World Wide Web Model

Problem

Current model is competitive, for example webmasters need to create multiple resources or farms pointing to each other in certain hierarchy to attract traffic and revenue to earn their living. They often create many websites with lookalike content and redundant data, wasting gigabytes of traffic as they compete with each other to reach top positions in the search engines producing more and more competition ***[see 3.6]***.

> *According to Cisco's statistics and research in the past 20 years the Internet traffic grew from 100 GB/hour in 1997 to 2000 GB/second in 2007 and over 30TB/second in 2017.*
>
> *In 2017 traffic usage was 50512 Petabytes/month for Internet video, 11061 Petabytes/month for web, email and data, 5858 Petabytes/month for file sharing and 189 Petabytes/month for online gaming, and a total of 67620 Petabytes/month, and this number is already getting near 85000 Petabytes/month in 2018.*
>
> *And as the experts say, by the statistics the amount of energy which is around 416 Terawatts/hour of electricity that data centers use exceeds the amount of energy that is used by the whole UK (300 Terawatts/hour) and will treble in the next decade, having a significant impact on the effect of global warming.*

If the webmasters don't market their own products, they market products or services of others and this brings us to another problem of "dream products" or "dream services" that are offered to the clients in order to sell better, since current model does not require trust, sellers use this behavior leaving unhappy customers behind.

> *According to the White House Office of Consumer Affairs statistics for customer satisfaction report, it's not the price that turns the customers away, but the overall product quality, and **91%** of the unhappy customers will not complain, but will rather turn to the competitor, and **55%** of overall customers will rather pay extra to guarantee a better service right from the start.*

Hyperlinks work only one direction between the documents and it doesn't give flexibility to the structure.

So the current model is structured in such a way that it dictates principles of competition among individuals instead of collaboration, control of information over geographical borders and manipulation by some media agencies for their profit, creating disputes among great minds, leading to confusion and conflicts instead of uniting them, the honesty of sellers and quality of marketed "dream products" suffer greatly, webmasters create large amounts of alike content to attract more traffic and compete with each other producing a lot of redundant data and waste of traffic to market goods or services.

All of the traffic and centralization happens through a small number of large third parties or nodes that have their influence on the whole model.

The centralization makes users dependent on third parties and lose any kind of privacy.

Solution

The new model is based on collaboration and principles of collective intelligence where nodes collaborate to distribute data in P2P alike principle, sell products instead of competing, manage traffic and allocate nodes through traffic managing algorithms where traffic load is optimized based on the nodes distance and partial load from

different shared resources, and Traffic Managers are rewarded by the system when performing these tasks.
Honesty is rewarded by being descriptive when offering services or selling goods, which gives more satisfaction to the returning customers and improves overall services quality. Rewarding and information freedom is the integral and crucial part of the network where borders of countries or continents don't matter and manipulated information does not exist on a global scale.

3.2 Freedom of Information
Problem
Often the information is controlled or manipulated. Some news agencies add an extra "spark" or twist to the meaning of the information they distribute for sensation and extra rating. Some countries block others useful and valuable resources and some resources are blocked through the borders even if they don't break any applicable law.

Solution
Gruad model will use its own protocols based on encrypted VPN and P2P with modifications, speed optimization and solution to the exit node problem that will be applied by the intelligent algorithms of Traffic Managers where needed.

3.3 Exit Node
Problem
When using VPN it is known that you can become an exit node, basically an address that can be used for evil doings, when someone can use users IP address on network with VPN and perform criminal actions like stealing and user IP address might be recorded for performing these actions and be blamed for something user didn't do.

Solution
The nodes will be used through traffic managers to receive the address of the nodes, in Gruad Cyberspace the addresses are marked and addressed by hashes instead of the IP; the hash address is looked up by Traffic Manager and returned to the requesting node. The protocols are structured in such a way that the requesting node, a user, is not acting as the exit node. Even if the access to the device that runs Traffic Manager was somehow hacked, the Traffic Manager which finds and submits the data is structured in such a way that it cannot be used as an exit node for accessing any resources apart from the functions that are predetermined by its operations.

3.3. Traffic and Internet marketing, adware and other related issues
Problem
The web traffic is a flow of data across the Internet. Current model uses a lot of web traffic and data redundancy for marketing to generate leads and revenues for successful sales. The model works in such a way that variations of the same information are repeated in multiple places, sometimes you can see almost the same content on different websites when performing search, multiple web pages and are duplicated many times by competing webmasters. It also creates another problem known as "Link Rot" when hyperlinks become permanently unavailable, failing to update out-of-date web pages that clutter search engine results.

The data centers use a lot of space and power consumption to store and transfer data.
According to statistics, the enormous amount on energy supplies will triple the next decade and as many experts predict might affect the process of global warming.

Another problem is the adware that is used through cookies and weak spots in browsers to market products based on user's searches, sometimes this approach is also taken to inject spyware to steal user's private data through the security holes in the browsers.

Solution
The architecture of "Intelligent Nodes" allows distribution of data globally through the P2P interconnections or Traffic Managers, reducing the data redundancy, where webmasters don't need to create multiple copies of a website, but to distribute it through Webmasters network indexed by Traffic Managers through Node Maps relations and routing records.

The search works through Traffic Manager Interface, placed either on dedicated users machine or dedicated server. Traffic Manager is a tool and intelligent mathematical interface that will analyze the data on the network from the closest nodes to furthest nodes. Everything related is interlinked in the Gruad network. The algorithm will also use space to store web documents tags and version hashes to easily locate them through nodes map and load from the closest resources when possible for best users' experience. If only parts of original document are located on closest nodes, then the traffic manager will first combine the original document version from those sources and will load missing parts from further ones.

Such design will optimize speed and performance of search and will intelligently use traffic resources resulting in less data redundancy and less traffic.
Also it is capable of carrying out complex search patterns more effectively than traditional search systems and implement search capabilities of nodes in the principle of "5 handshakes" with lower resources usage. Existing data centers that may use Traffic Managers can use the resources with lower power consumption and optimized traffic load.

If there are multiple traffic managers close to the user, they will distribute the document loading and will "cooperate" to do so.
For search performance and routes calculations Traffic Managers are rewarded with GRUs according to the percentage of traffic load assigned to them on the network at the current block timestamp.

3.4 Honesty and Transparency
Problem
It is well knows that many companies/sellers will give a lot of promises to sell their services/goods and what the client will get doesn't always reflect those promises.

Solution
The system will integrate honesty reward function. Once the seller or services owner will make a successful sale, the client will be able to rate sellers services or products regarding the sellers description. If the client got what he was actually offered, he will rate seller with "+" for his honesty. In this case 50% of the mined coins are reserved for this by the GMatrix and are distributed among sellers based on the total network selling percentage at the time of the sale time stamped block. Payments for these actions will be carried out with EMN. In case of "-" rating, the seller or the service owner will become suspicious to the clients if they don't have a lot of positive responses and will eventually lose customers trust.
So it is more profitable to be honest than dishonest in the platform.

3.5 Webmasters
Problem
In the current model webpages appear in the search engines top as they drive more traffic and visitors, giving revenue to the Webmaster, and the typical model is often used: the webmasters create up to hundreds of sites that will be linked one way to direct traffic to page that needs to be promoted. It is even built into hierarchical structure of webpages, known as farms, using a lot of space and traffic with redundant information to perform simple marketing tasks.
Many webmasters create such structures and compete with each other over higher positions in search results,

wasting a lot of space and time and producing a lot of redundant data.

Solution
If the current model uses the concept of 1 webmaster to many resources, the Gruad model uses the concept of 1 resource to many webmasters.
With the way the system is architected a webmaster needs to build just one cyberspace document with content that will attract visitors and then this document is shared through the chain of webmasters, linking to the whole page content or just a single one. The owner of the original documents gets reward in GRU coins (Gruads) from the visitors as well as when document is accessed on another node of another webmaster in ration 70% / 30%.
With this system structure the webmasters will save space, optimize traffic and load speed, they will promote information in collaboration with each other instead of competing and will receive better results with no competition and less traffic load.

3.6 Content and Content Quality
Problem
The content on the web document is formed on personal skills and knowledge, but could always be better; there are no limits to perfection. If the current publisher of the document is not able to provide high enough content quality, the content can be bought from other resources.
Licensing in the current model doesn't give much flexibility. Usually licensing of the whole document is applied even if you need just a part of it, making it unpractical for the end user to purchase expensive quality content all the time.

Solution
The purchase in the system happens through linking to the original content, and it is not necessary to buy the license of the whole document, it can be just a word, a line, a paragraph, picture, picture fragment or part of the video.
Licensing in Gruad Cyberspace will be based on "by information bit" and the license price is calculated only on the portion that you have purchased and will be estimated on the data against power ratio.
The purchase of digital content is suggested to be done with GRU, but it's up to the user or the selling platform.

If someone has linked to a document, then they are able to modify the content to better quality and offer to update the existing original if it's better. This approach will allow information and content to have better quality based on collaboration and principle of collective intelligence approach, constantly improving overall quality of the content.

3.7 Data Linking and Search on the Network
Problem
In the current model of World Wide Web the hyperlinks are used in such a way that the content is linked only in one direction which doesn't give high structure flexibility and poor dependency between the documents.

Solution
The documents in Gruad will be interlinked and related to improve the network structure and avoid further centralization and monopoly. If the original document is removed from the network, the first node that has a first copy will become the original owner of the document if such.

3.8 Sold Content Quality and Licensing Types
If someone for example has purchased the fragment of your document, they might need to alter the content their way to match the content in their document. Once this is done, the owner of the content will be notified that another node has changed the content and owner will be able to see the changes. If the owner likes new edit better than the original, they can trigger the original content to be replaced by the new content. Then the editor gets the

reward from the platform in GRU. The owner of the original document can also invite the editor to alter the whole document to improve the content quality. In this case the editor can edit the document for GRU reward also based on the amount of data that was edited or another sort of agreement.

Other nodes that are linked to the original documents will be notified also if they wish to update the content or to keep the previous version that matches their document better and will also be able to request editing from the node that edited the previous document.

This concept will allow constant improvement of content quality in the cyberspace and the society.

3.9 Mining power consumption
Problem
Crypto currencies networks power consumption combined exceeds amount of power that a small sized country uses and this is intended to grow.
This is done intentionally for complex computational algorithms to protect the networks against attacks.
It takes a lot of power that could be also used for solving other computational and scientific problems.

Solution
The GMatrix is logically architected for higher level of encryption, but requires less power consumption and is "greener". The aim is the development of data centers and mining farms across the world partially and later fully based on the renewable energy sources.
Existing farms and data centers will be able to dedicate their power to the main network under Gruad protocols. Miners and scientists will be able to buy power for GRU to mine EMN, ensuring the GMatrix's functionality and network stability and solving complex mathematical problems and algorithms with available computing power.

3.10 Currencies
Problem
In the current stage of crypto economy, the crypto currencies are evaluated against the fiat currencies. But if we take fiat currencies away from the model, it might not be yet self-sustainable and balanced without fiat currencies when it is purely based on the power (resources) sector is still quite complex to predict.
Of course world economy is much more complex than that and it always evolves, but the balance needs to be reached.

Solution
The GMatrix is built with two currencies that are mined and given as a reward.
First one is EMN (Emony) which is the coins for resources and products sector.
The second one is GRU (Gruads) which is the coins for data and information sector.
Both currencies are produced in the ratio of 1 EMN : 30 GRU per each block sequence which takes 3 minutes to solve.
The exact numbers, mining and rewarding processes are described further in ***section 5***

This is done to balance the data and resources sectors and will be reached through EMN and GRU ratio adjustment of two sectors values by intelligent algorithms network analysis.

3.11 Blockchain Architecture
Problem
The traditional Blockchain is designed to overpower any attacks with power used for block calculations and transactions rate cannot process large number of transactions in short amount of time.

Solution
The GMatrix architecture is designed for fast transactions processing due to combination of different algorithms and GMatrix technology which is based on combination of 5 blocks streams with different algorithms for different purposes and different mining protocols where blocks "out hashes" cipher each other before they are used as new "in hashes" and is also structured in a way to allows more flexible and smaller (in terms of hard drive space) block size.
The miners are randomly switched after each round and it is impossible to predict who will mine next block stream. 5 miners are assigned to 5 block streams, 1 to each and as the round is calculated, the block streams cipher each other through "out" and "in" hashes and the miners pass the hashes to the next miners who will be selected by the algorithm for the next round and so on. No miner will mine the same block sequence in a row.
It uses "greener", less specified hardware and less competitive approaches to avoid monopoly and competition.

3.12 Blocks Sizes and Space Allocation Problem
One known problem in blockchain technology is the hard drive space it consumes as the database of blocks grows. This is one of the reasons it is sometimes hard to plan and carry out the blockchain with flexible block size which results in limit of transactions rate if the network size increases.
So if there are more transactions, they become more expensive and not practical.
Unfortunately the Bitcoin networks transactions become more and more expensive instead of what was offered in the beginning.
Also as it grows it starts taking more space.

For example, in Bitcoin network on 13th of May 2012 the database size was just 1 GB. Just in one year time it went to 7.5 GB, and then it started growing nearly double every year.
May 2014 => 18 GB
May 2015 => 35 GB
May 2016 => 68 GB
May 2017 => 115 GB
Today it's approximately 150 GB.

With such expansion, by 2025 it might use huge amount of space. Of course this is just a prediction and hopefully there will be ways to optimize it as well as hardware technology will progress to larger media sizes.

Solution
Our aim is to develop the solution for flexible blocks so the transactions can be processed faster in all 5 block streams in GMatrix. As the network grows and blocks will use different ciphering algorithms, based on the miners equipment and type of blocks particular miner will mine it won't be necessary to store all of the data on a single miners drive, but miners will need to collaborate to exchange data to calculate and verify the whole GMatrix streams chain. This is done intentionally for two reasons: extra security and less drive space dedication.
Also an algorithm will be implemented similar to drive mapping that will allow storing the data of the GMatrix on multiple drives and the map will hold the address of the blocks allocation on the drives.

3.13 Solving the "ICO Bubble" problem

Problem

The problem of the ICO Bubble appeared with many ICO raising funds and there are possibilities when star-ups don't keep their promises or when collected funds were not used transparently enough which turns the whole process into sort of "Gold Rush" and not the improvement of the existing platforms.
This has produced problem known as the "ICO bubble" requiring additional regulations by authorities and financial institutions.

Solution

Tools will be developed that will allow the companies and start-ups to run the ICO, but the raised funds won't be frozen until the ICO ends, they will be stored in a safe vault that can be used to generate payments for labor allowing early development start, transparency and control by the community and the investors, who can affect the development process via discussion and transparent voting.
The business/start-up owners will be able to distribute funds accordingly without their direct access to the funds at the stage of the ICO. The unspent funds will be kept in the safe deposit box until the end of the ICO.
In case of unsuccessful ICO, fraud or unaesthetic business actions, remaining funds will be returned to the investors according the percentage of their total input. The fate of the business/start-up owners will depend on their actions and international law.

4.1 GRUAD MODEL COMPONENTS EXPLAINED

4.1.1 "Intelligent Node" (Diag. 1)

Related to physical object located on the network through which the user or an algorithm performs actions. Can represent a computer, server, phone or any other device, capable of mathematical and logical calculations.

[diag. 1]

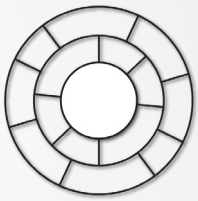
4.1.2 "Sub-Node" (Diag. 2)

Related to logical organization of an "Intelligent Node" and is linked to the physical media containing data storage.
The address of the logical node to be found by another node is mapped through the map matrix and is represented in the following format:
node hash : sub-node hash : node version hash
ex.: 2fd4e1c67a2d28fced : 849ee1bb76e7391b3a : 2c7391b93eb1218f21

[diag. 2]

4.1.3 Stream Ciphered Data Storage (Diag. 3)

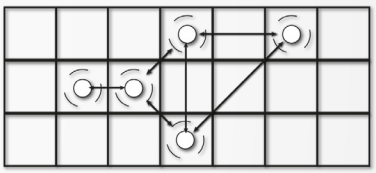
The actual data located on a physical media of the device, network or distant server, ciphered with security access keys or key groups and is managed or updated by the node and it's versions are verified through the GMatrix records, but the data itself is not stored on the actual GMatrix.



[diag. 3]

4.1.4 Nodes Map (matrix storage) (Diag. 4)

The map holds the map of nodes links on the networks and how their data is related and what version of the node is currently used.
For example if the website or its parts are shared between multiple nodes, then the node map stores which parts of the data storage holds specific data that is requested through the Traffic Manager and how they are linked and through which nodes.



[diag. 4]

4.1.5 Traffic Managers

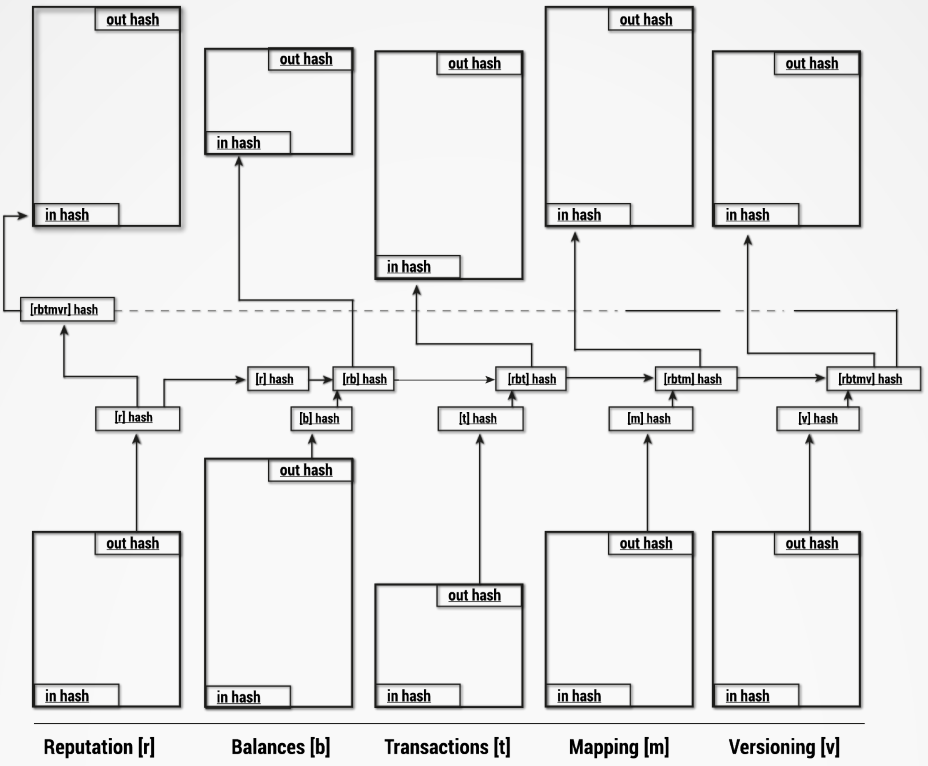
Traffic Managers are the tools that are located on dedicated machines or servers chosen by network users or webmasters if they dedicate themselves to such a role and traffic managers use protocols to perform tasks of nodes mapping and their relation on the network via node hashes as addresses, as well as the decentralized distributed search engines.
The Traffic Manager choses closest nodes to optimize traffic and can load data from multiple nodes. The node address and data is public, but is not related to a particular person. Traffic managers collaborate together to find nodes on the network through each other's maps and return fetched data to requesting nodes.
All data on the network can link or be shared to avoid data redundancy.

4.1.6 "GMatrix" (Diag. 5)

Each node ("Intelligent Nodes" and "Sub-Nodes") have 5 records that determine their specifications.
These are *"Reputation"*, *"Balance"*, *"Transactions"*, *"Mapping"* and *"Versioning"* records.
Each of these records is related to the GMatrix streams. The "GMatrix" is the actual blockchain or block matrix to be exact, consisting of five block streams, where each of the records is processed and secured by miners.
There are five miners minimum that mine the GMatrix and after each stream separately and on successful block they are randomly switched. Each stream block out-hashes are multiplied and ciphered and used as hash for next stream in-hash for another sequence round. This provides extra security for network with less power consumption

for single block and creates less competition among miners and mining pools.

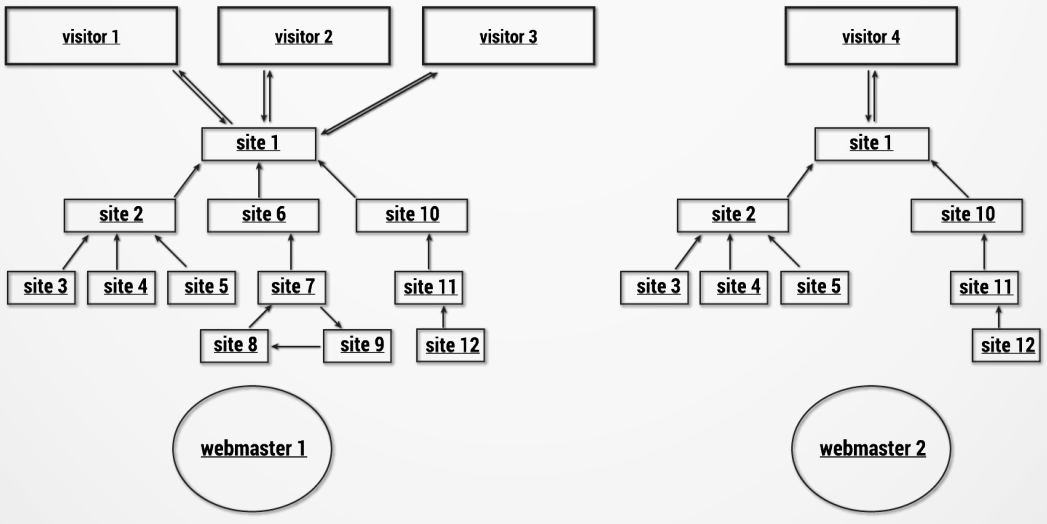
[Diag. 5: GMatrix logic]



4.1.7 Webmasters, Search and Traffic Allocation

As in traditional model the webmasters perform tasks of data allocation on the network and its distribution to the end users, but unlike in the current model where competition takes place between the webmasters *(Diag. 6)*, in Gruad Cyberspace they collaborate to share that data and get rewarded by the GMatrix for data sharing and quality. This logic is aimed to reduce redundant data on the network, optimize traffic load, speed up search,

[Diag. 6: Current taffic allocation and SEO model. Centralized]

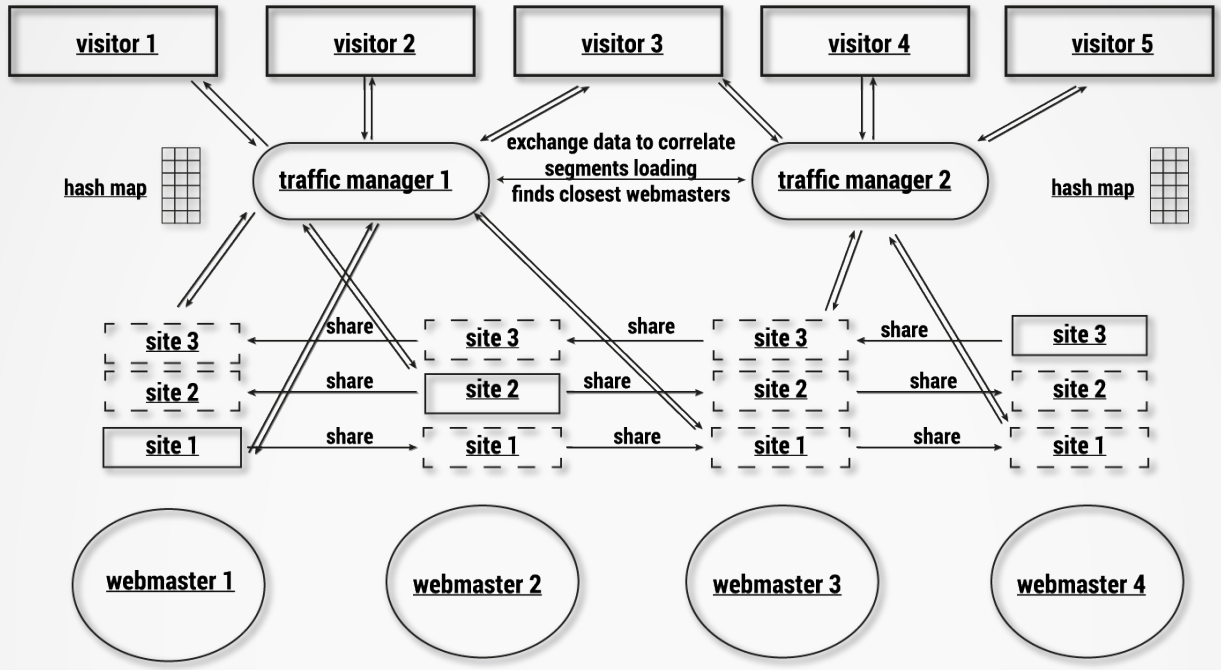


Webmasters produce multiple websites and redundant data to attract more traffic and more visitors to their sites, creating more competition and centralized structure around nodes.

optimize search algorithms, reduce competition among webmasters and allow freedom of data independently on the country or continent borders.

If current model uses the concept of 1 webmaster to many resources, the Gruad model uses the concept of 1 resource to many webmasters *(Diag. 7)*

[Diag. 7: Gruad taffic allocation and SEO model. Decentralized]



Webmasters collaborate to share websites and share the revenue instead of competing. Traffic managers find closest webmasters to load data faster and save traffic. Decentralized.

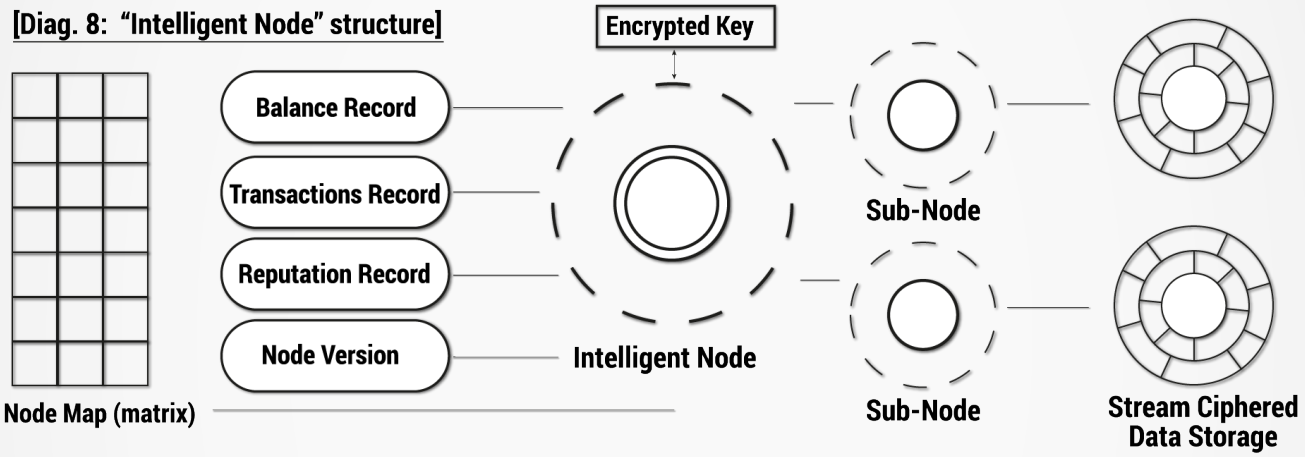
4.2 GRUAD MODEL COMPONENTS ROLES, OPERATIONS AND REWARDING

4.2.1. "Intelligent Node" and interaction logic (Diag. 8)

The "Intelligent Node" has logical connection to the related sub-nodes that in their turn are linked to the data storage on the same media, another device, network or server.
Nodes relations are stored in the Node Maps (matrix maps) and each user connects to that data through an "Intelligent Node" or links to another node (as in the example with the website). Each "Intelligent Node" has its address in corresponding ciphered format:
node_hash:sub_node_hash:node_version_hash

and it is understood by the platform as the node address, which sub-node should be accessed and what the latest node version is (as well as if the previous from the last versions should be accessed and whether they exist).
All nodes have 5 related records and these are *"balance"*, *"transaction"* , *"reputation"*, *"node version"* and *"node map"* records.
They hold current node specifications and other important information about the node and are processed and interacted through GMatrix with any transactions, version changes, updates etc., as well as nodes relations and interaction with other nodes on the network.

[Diag. 8: "Intelligent Node" structure]



4.2.1.1 Reputation Record

The reputation record determines if the node has performed honest transparent actions on the network and has good reputation. There are two types of specifications to the reputation record for the nodes, one for the reputation for sellers and services providers, and the other for traffic managers and webmasters nodes.
With sellers and service providers, on successful and honest sale nodes reputation records is adjusted based on customers experience and reward is given in EMN crypto coins from the GMatrix on successful sale judged by the customer.
With Webmasters, the reputation is based on the content load and usefulness to the visitors. Resources that are reported with bad reputation will be excluded from the Traffic Managers maps. Webmasters and Traffic Managers are rewarded with GRU crypto coins from the GMatrix.
If there is a chance that Traffic Manager will be installed on dedicated device and its code will be manipulated somehow to bring users fake or harmful results, such Traffic Manager won't be found in the GMatrix's nodes map and will not be accepted or used on the network.
If the nodes reputation record gets only negative responses, then this node will not be trusted by users and clients, as they will be able to see the reputation record.

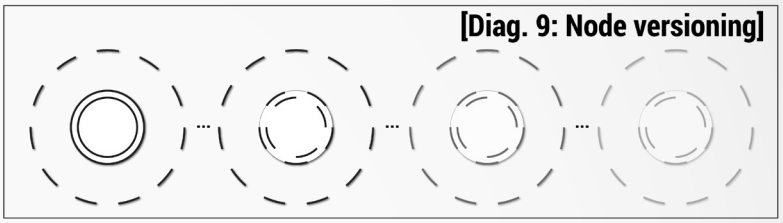
4.2.1.2 Balance Record

Balance record keeps information about the nodes balance in crypto coins, whether EMN, GRU or both and hold the address or addresses of the nodes balances.

4.2.1.3 Transaction Record

The record that stores the crypto coins transactions between the nodes, as well as the exchange records.
Also it is has the record of "Agreement" that is possible to use if the transactions are based on the multiple basis (like a monthly payment for example) where a certain amount can be secured in a safe vault from the start, to ensure such type of payments, and scheduling record, that allow to configure payments on certain dates to multiple users or once the job is done. These records can be used, for example, by job provider who is able to store the balance on the node and ensure monthly payments to workers for a year with recurrent monthly payment. There are many possibilities.
Another benefit is the security, even if a hacker will be able steal the private key and to access such vault, it will be impossible to trigger the payment to the new address. While that happens, the actual owner of the vault will be notified through the connected node and will be able to change the access keys.

4.2.1.4 Node Map Record


[Diag. 9: Node versioning]

The Map record stores information about nodes relations on the network, whether it's the sub-node of a node, a websites data and if the website is shared or partially distributed through multiple nodes. It is stored in the mathematical matrix map format and uses stream ciphering for fast encryption/decryption and processing by miners to be available for the Traffic Managers and Webmasters.

4.2.1.5 Node Version Record

This record is linked with the Nodes Map and it shows which version of the node is connected to another node. When there is a change in the node, sub-node, data storage or its version, the record is updated in the node map and then the GMatrix. All of the previous versions can be stored for a backup purpose which is by default done automatically, but can be disabled if the user doesn't need the backup.
With this approach Gruad also solves the cost effective backup problem for any end user that can't afford expensive backup solutions from third parties and is able to store all the previous versions of the node on local media or cloud.
When the nodes version is updated, all of the related maps are updated and other linked nodes are offered to update the content that they are linked to, even if they don't, the same reward ratio of 70%/30% is kept.
If the data is no longer available then the first node becomes the original holder and the node map is updated in GMatrix. This also solves the problem known as "Link Rot".

4.1.2. Sub-Nodes

Each sub-node is logical representation of a node link between the "Intelligent Node" and existing Stream Ciphered Data Storage via logical map. The sub-nodes of different "Intelligent Nodes" can be linked to each other via node map and can form a resource, can be used as shared or combined resources.

4.1.3. Stream ciphered data storage

The storage where the actual data is encrypted and is protected via different types of keys or groups of keys based on the storage purpose and required security level. Algorithms based on stream ciphering are used to allow fast encryption/decryption of data, but without the key that the user holds, other parties cannot match or decipher the content. The complexity of encryption is based on the access key. If it is, for example, a shared resource like a web site, then the encryption is minimal or not necessary for accessing such data, or if the storage is personal, like an email account or phone data, then it uses AES like secure private key only known by the end user, then the ciphering process and algorithms are different from the open type of storage.

4.1.4. Node maps

Node map record holds the relation of the node with other nodes on the network and maps of segments of data that are linked between the nodes. Structured in mathematical matrix and processed via stream ciphering for ultra-fast performance with intelligent algorithms.

4.2. GMatrix and Mining

GMatrix is the backbone of the platform which holds the specifications of all the records and nodes on the network and how they are linked, as well as the records for balances and transactions.
Processed and calculated through mining by 5 types or groups of miners who are rewarded by the EMN crypto coin for power consumption and network sustainability.
The given time for each block sequence is 3 minutes.
After each successful block sequence (5 different types of blocks that are mined) there is a stage of in-between blocks hashing to ensure extra encryption and miners are randomly switched to give extra security to the network and reduce competition between the miners and mining pools. The same miner doesn't mine two blocks.
As the sequence of blocks completes, then the out hashes are rehashed between the streams and used as in hashes for the next sequence.
As the data processing and requesting in Gruad Cyberspace happens instantly through the Traffic Managers and Webmasters, the verification process and storage of processed data happens inside the GMatrix through sequence of blocks streams mining.

5 COIN SUPPLY AND REWARDING

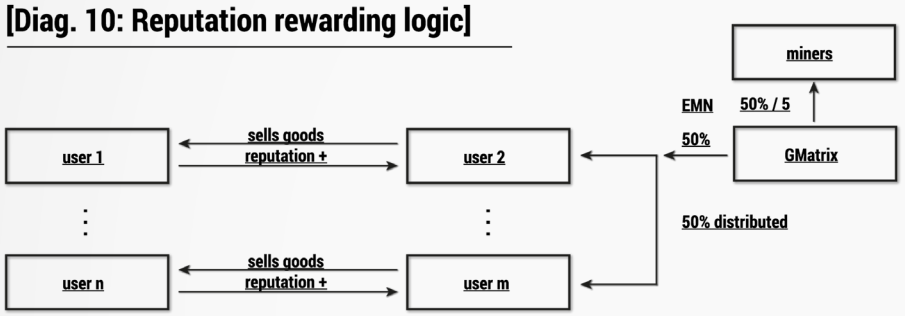
With each mined sequence of blocks there are two crypto coins produced by the system that are used for rewarding the miners, sellers, service providers, webmasters and traffic managers.

The EMN coins are used for the resources and products sector.
The GRU coins are used for data processing and information management sector.

This amount is predetermined to have enough coins for data processing and all of the platforms operations.
Each block sequence produces 300 EMN and 9000 GRU.

50% of the mined EMN are given to the miners divided in 5 which make it 30 coins for each miner or the pool.
50% of the mined EMN are given to sellers and services provides for their honesty as they sell their products or services and are given positive response for their honesty stored in the reputation record. This % of reward is calculated from the times the sale was made, but after the reputation was given. The whole % depends on the total items that were sold at that block timestamp and are distributed between all the sellers based on % values of their sale.

[Diag. 10: Reputation rewarding logic]



How rewarding is calculated

reward percentage = sold value / total goods value
reward = 50% * reward percentage

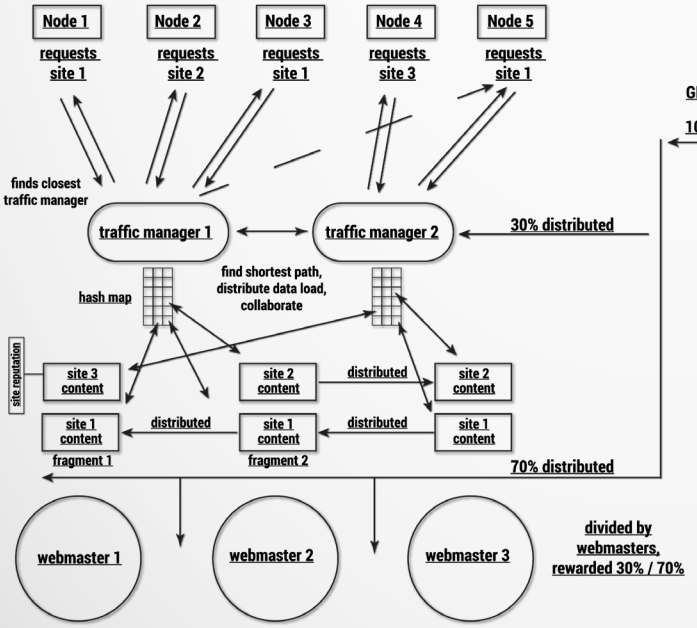
miner_reward = 50% / 5

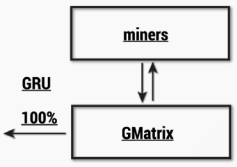
example:
50% = 150 coins
total sold for 1000, user1 sold for 100
reward percentage for user 1 = 100 / 1000 = 0.1
reward for user 1 = 150 * 0.1 = 15 coins

reward_for_each_miner = 150/5 = 30 coins

30% of GRU are given to the traffic managers and the distributed value is based on the % of the hash load they used for performing of search algorithms and request responses.
70% of GRU are given to the webmasters as their sites are visited. 70% of which are given to the original content holders and 30% to the webmasters that collaborate to share that content.

[Diag 11: Webmasters and Traffic Managers rewarding logic]





How rewarding is calculated

reward percentage
30% for traffic managers
70% for webmasters
webmasters reward
70% original content,
30% distributed content/ # of distributions

total = 0.3 * (traf_manager / (num_man * % of hash_load) + (0.7 *
* (count_or_link * 0.7 + (count_d_link * 0.3 / num_links) * % of hash_load)

example: (for simplicity lets assume that each webmaster has equal hash load % and the same % of original and distributed content bytes of data)
100% coin reserve = 9000 coins
traf_man1 = 60% hash load = coin_reserve * 0.3 * 0.6 = 1620 GRU
traf_man2 = 40% hash load = coin_reserve * 0.3 * 0.4 = 1080 GRU
webm1 = coin_reserve * (distributed_links * 0.3 + orig_links * 0.7) * 0.7 = 2226 GRU
webm2 = coin_reserve * (distributed_links * 0.3 + orig_links * 0.7) * 0.7 = 2226 GRU
webm3 = coin_reserve * (distributed_links * 0.3 + orig_links * 0.7) * 0.7 = 1848 GRU

A sequence of blocks is mined every 3 minutes. The difficulty of the network is doubled every 684000 sequences, approximately 4 years and the coin supply is divided.

Total reserve of possible coins emitted:
410,400,000 EMN and 12,312,000,000 GRU, after that the coin emission will stop.
Total time to reach the emission is approximately 150 years.
50% of the total supply will be mined in the first 4 years.

The initial ratio between the EMN and GRU coins supply is 1:30

Number of Blocks	Years	EMN reward	GRU reward	Total EMN (period)	Total GRU (period)
0 - 684000	4	300	9000	205,200,000	6,156,000,000
684000 - 1368000	8	150	4500	102,600,000	3,078,000,000
1368000 - 2052000	12	75	2250	51,300,000	1,539,000,000
2052000 - 2736000	16	37.5	1125	25,650,000	769,500,000
2736000 - 3420000	20	18.75	562.5	12,825,000	384,750,000
3420000 - 4104000	24	9.375	281.25	6,412,500	192,375,000
4104000 - 4788000	28	4.6875	140.625	3,206,250	96,187,500
4788000 - 5472000	32	2.34375	70.3125	1,603,125	48,093,750
5472000 - 6156000	36	1.171875	35.15625	801,562.5	24,046,875
6156000 - 6840000	40	0.5859375	17.578125	400,781.25	12,023,437.5
6840000 - 7524000	44	0.29296875	8.7890625	200,390.625	6,011,718.25
7524000 - 8208000	48	0.14648438	4.39453125	100,195.3125	3,005,859.375
8208000 - 8892000	52	0.07324219	2.19726563	50,097.65625	1,502,929.6875
8892000 - 9576000	56	0.03662110	1.09863281	25,048.828125	751,464.84375
9576000 - 10260000	60	0.01831055	0.54931641	12,524.4140625	375,732.421875

6 PLATFORM FRONT-END AND TOOLS

6.1 Gruad Browser

Specialized browser will be developed to allow the users to connect to thier node and operate in Gruad Cyberspace. The browser will have the interface that will allow not only to see the content of the nodes on the network (if they are predetermined for that, websites for example), but also to explore details and specifications of the users own Intelligent Node, the bidirectional links and dependencies and all the related records regarding the balances and transactions.
Tools and plug-ins will be developed for analysis and statistics of data sharing and distribution, analysis of reputation and other things described above.
The browser will have VR capabilities to turn the existing interface into fully manageable 3D space with VR equipment that allows you to reach beyond the screen size and enter fully dimensional world for better experience and interaction.
Browser will be developed for 5 platforms: PC, MAC OS, Linux, iOS and Android.

6.2 Webmasters Tools

6.2.1 Development CMS

The intuitive CMS (Content Management System) that will allow the webmaster to build new websites with easy graphical interface or code, and also manage the content and/or link to other nodes.
Plug-ins for analysis, payment processing and other useful functions to be developed as well.
The CMS will differ from the traditional ones as well as the websites that will be created, they will be more cyberspaces oriented and the aim is to differ them from traditional paper that we are able to use without the computer. The aim is to give highest flexibility and user comfort with Gruad Cyberspace.

6.2.2 Intelligent algorithms

Algorithms that will analyze the Intelligent Node, related nodes and how the data is managed distributed and will give detailed analysis if the content was modified and if it is more successful in the search indexing through traffic managers. The aim of the platform is the quality of the content and not blind distribution of data for visitors attraction for marketing purposes.

6.3 Traffic Manager Interfaces

The interface that will be used for traffic managers to be installed on servers or dedicated machines and will serve as search and indexing tools and will collaborate to enable faster data finding and loading from the closest resources. No one is able to see the nodes physical location, but it is marked through the node map closest routes for speed and traffic optimization.

6.4 Exchanges and Their Interfaces

EMN and GRU exchanges where any user can enter and exchange the EMN for GRU or vice versa. For example miners will have EMN by default and webmasters will have GRU. Such tools to be provided for integration and creation of exchanges for everyone's comfort.

6.5 Wallets and Safe Vaults

6.5.1 Software Wallets

Wallets will be developed for the users to install and run on their machines and will be developed for Windows, Mac OS, Linux, iOS and Android

6.5.2 Web Wallets

Wallets interfaces to use with the actual GMatrix and they will be available for creation at the current address: Emony.info alongside with other GMatrix APIs as well as the interfaces that will be available at Gruad.com

6.5.3 Safe Vaults and Tools

Safe vaults as well as development tools for safe vaults will be produced for users to create their own safe vaults and safe deposits, as well as the tools to run multiple payments like labor predefined for multiple nodes.
The idea is to build the tools that will allow storing the amount in crypto coins in the vault resistible to the hackers' attacks.
For example if the users vault will be hacked, then the attacker won't be able to transfer the funds to another address as the transfers will be predetermined to certain nodes and that will be written in the GMatrix, but the dates will be a flexible subject, controlled by the original user.

6.6 Deep Analysis Algorithms

Intelligent algorithms will be developed to analyze the load between two sectors, the Social Sector and Resources sector to balance the network between the GRU and EMN ratio based on data processing and mining power data analysis.
Algorithms to analyze the data processing by Traffic Managers and optimal data loading based on Node Maps.
Algorithms to analyze if current node can be reached and whether the VPN type protocols should be used.

6.7 Other Tools and Algorithms

Other tools algorithms to be announced as the development process will start.

7 ROADMAP

Q1 2018 PRE-ICO STAGE

This stage involves funds rising and start of the development process based on the funds raised as well as marketing

Q2 2018 ICO STAGE

This stage involves funds rising and start of the development process based on the funds raised as well as marketing

PRE-ICO and ICO stages are described in greater details in **part 8**.

Q1-Q3 2018 DEVELOPMENT PROCESS

As we will start raising funds, after the PRE-ICO stage 1 the development process will begin, as the funds will be used to start paying for development teams labor. There will be 4 teams working on the platform including the Gruad Team and other programmers and enthusiasts from around the world: Europe, USA, Russia and India with experience in Blockchain, software engineering, interface and front-end development, cloud architecture, algorithms and patterns design, VR and other fields, who will be involved in GMatrix and Gruad platform development as well as interfaces, algorithms and tools.

Q3 2018 TESTING AND BETA RELEASE

At this stage the contributors will have access to the beta versions of developed platform for testing and acknowledgement.

Q4 2018 - Q1 2019 PLATFORM RELEASE

The functional version of the developed platform will be released and accessible at GitHub, Gruad.com and Emony.info websites.

The contributors will be updated on every stage of the development process as well as they will be able to try and use beta versions of developed tools before the final release.
Any unused contributed funds will be reserved by the team and used for later development stages.

8 PRE-ICO AND ICO STAGES AND TOKENS

The PRE-ICO will run in 3 stages and ICO will run in 4 stages.

The contributors will be able to exchange their tokens for the crypto coins that will be pre-mined by the team members and hired miners as the system development will end.

The early PRE-ICO contributors will get bonuses of double reward as they their early tokens will be exchangeable for GRU coins as well as the equivalent amount (in 30:1 ration) or EMN coins, so they will get double during the first 3 stages.

There will be total of 700,000,000 tokens to be distributed, 50,0000,000 of which will be distributed among team members and used for advertisement campaigns and giveaways, and the equivalent amount of coins will be premined in the first 6 month of mining

Crypto currencies that will be accepted by the contributors are:
Bitcoin (BTC), Bitcoin Cash (BCH), Ethereum (ETH), Dash (DASH), Monero (XMR) and Litecoin (LTC)

There is no contribution amount limit, no minimum, no maximum, but as the suggestion it should be reasonable. For example to get just 10 tokens in BTC and pay transaction of $20 makes no real sense, so it all just depends on the contributors will.

For example the contributor transfers 1.53 LTC in PRE-ICO stage 1 where it is equivalent to $0.01 per token, it will be equivalent to $300 for example, and will equal to 30000 GRU + 100% bonus of 1000 EMN.
At the ICO stage 1, at value of 0.05, it will be equivalent to 6000 GRU.

PRE-ICO [Stage 1]
100,000,000 tokens to be distributed at this stage for the value of $0.01 per Token in any comfortable of the mentioned crypto currencies.
Includes double bonus amount of Tokens predetermined for GRU as well as EMN (in ration 30:1)

PRE-ICO [Stage 2]
100,000,000 tokens to be distributed at this stage for the value of $0.02 per Token in any comfortable of the mentioned crypto currencies.
Includes double bonus amount of Tokens predetermined for GRU as well as EMN (in ration 30:1)

PRE-ICO [Stage 3]
100,000,000 tokens to be distributed at this stage for the value of $0.03 per Token in any comfortable of the mentioned crypto currencies.
Includes double bonus amount of Tokens predetermined for GRU as well as EMN (in ration 30:1)

ICO [Stage 1]
100,000,000 tokens to be distributed at this stage for the value of $0.05 per Token in any comfortable of the mentioned crypto currencies.

ICO [Stage 2]
100,000,000 tokens to be distributed at this stage for the value of $0.10 per Token in any comfortable of the mentioned crypto currencies.

ICO [Stage 3]
100,000,000 tokens to be distributed at this stage for the value of $0.30 per Token in any comfortable of the mentioned crypto currencies.

ICO [Stage 4]
50,000,000 tokens to be distributed at this stage for the value of $0.50 per Token in any comfortable of the mentioned crypto currencies.

No more Tokens will be produced during or after the PRE-ICO and ICO stages, 700,000,000 is the maximum Token limit.

To acquire tokens please visit http:gruad.com and press the "Acquire Tokens" button.
It will take you to the contributors' page to register.

You can choose one of the 3 possible roles:
1. Token Holder
You can select which crypto coins most appealing to you from the list to acquire tokens and after the registration verification you will be able to see the address to send the coins to.
Once the coins are received, it shouldn't take more than 24-48 hours for the tokens (in the amount proportional to the amount or received coins) to appear in your account (the tokens are sent manually, that's why it doesn't happen instantly), but once we are aware that your have sent the funds, you should be notified with an email.
Once the tokens are available on the account, you will also be able to see the addresses and transactions on http://emony.info

2. Webmaster
We offer a referral partners program with 5% reward for each Contributor that has acquired the tokens

3. Freelancer/Developer
If you are a programmer or you have skills that you believe might be of importance to us and you are ready to develop in exchange for tokens (at the value of current PRE-ICO or ICO stage), please don't hesitate to contact us, share your experience with us, portfolio, CV, and anything you believe shows your skills and knowledge.

9 FUTURE RELEASES AND FURTHER DEVELOPMENT PLANS

As the initial development process will end and the platform will be live, there are other tasks that are planned for the next stages of development scheduled for 2019 - 2022:

9.1 Development of the secure decentralized free messaging and video app.

9.2 Development of the free open source Gruad Operating System for native interaction with Gruad Cyberspace

9.3 Development of Gruad Operating System for portable and mobile devices

9.3 Renewable energy sources for mining and scientific calculations

Construction and development renewable energy based mining farms and connection to existing renewable energy plants for construction of mines and centers for mining and scientific calculations (mining equipment that will be available for rent remotely for easy mining solutions).

9.4 VR Tools

The tools to be developed that will allow development of other platforms on VR basis, like medical simulators, scientific tools and tools for society's benefits.

9.5 Business Tools

Secure decentralized tools and interfaces for conferences and online meetings.
Usually such tools are very expensive to use and require expensive dedicated equipment, these technologies will be revolutionized with Gruad Cyberspace.

10 RELATED LITERATURES AND RESEARCH

"Chronicles of IT revolution"
by Batyr Karruev

"Internet, short history and effect on society"
by Batyr Karruev

"The Wealth of Nations"
by Adam Smith

"The Theory of Moral Sentiments"
by Adam Smith

"Security Analysis"
by Benjamin Graham and David Dodd

"Extraordinary Popular Delusions and the Madness of Crowds"
by Charles Mackay

"Freakonomics"
by Stephen Dubner

"The Great Unravelling: Losing our Way in the New Century"
by Paul Krugman

"Human Communication in Society"
by Jess K. Alberts

"Media/Society: Industries, Images, and Audiences"
by David R. Croteau and William D. Hoynes

"Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World"
by Don Tapscott and Alex Tapscott

"Leonardo to the Internet: Technology and Culture from the Renaissance to the Present"
by Thomas J. Misa

"Digital Justice: Technology and the Internet of Disputes"
by Ethan Katsh and Orna Rabinovich-Einy

Online resources: ***Wikipedia, Cisco, Statista***

Whitepaper v.1.0

Some algorithms described are still the subject to change during the development process in terms of achieving best performance and security through testing.

Some algorithms and tools will be described in greater details in future releases of the Whitepaper, as well as detailed description of other tools to be developed.
But the CONCEPT described in this Whitepaper is THE MODEL TO REMAIN.

Gruad Cyberspace
http://www.gruad.com

GMatrix
http://www.emony.info

GRUAD CYBERSPACE
2018.