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Appendix to the Bitbon System Public Contract
"Mining in the Bitbon System"

*Appendix "Mining in the **Bit**bon System" (hereinafter referred to as the "Appendix") determines the fundamental principles and order of implementing mining in the **Bit**bon System, establishes the status of a **Bit**bon System Miner, regulates his/her rights and duties in order to ensure support and development of the decentralized execution environment of the **Bit**bon System.*

CONTENTS

SECTION 1. GENERAL

Chapter 1. Terms and Definitions

Article 1. Usage of Terms

1. The terms used in this Appendix shall be interpreted in accordance with the definitions provided below:

1) **Assetbox** is a record (cell) in the blockchain in the form of an identifier created in the **Bit**bon System account for storing and transferring digital assets.
2) **Miner's Assetbox** is an Assetbox managed by a **Bit**bon System Miner, which is a part of a mining pool and participates in Consensus building mining.
3) **UTC** (Coordinated Universal Time) is the primary international time standard, which is effectively a successor to GMT (Greenwich Mean Time).
4) **Base power** is a parameter of a miner's Assetbox, which is calculated based on the individual power of an Assetbox and powers of all Assetboxes of the first line of the mining pool.
5) **Base balance** is the total number of **Bit**bon accounting units in the root Assetbox of a miner and all Assetboxes in the first line of the mining pool.
6) **Assetbox balance** is the number of **Bit**bon accounting units in the miner's Assetbox.
7) **Transaction block (block)** is a special structure for recording a group of transactions in the distributed ledger.
8) **Block producer** is a block producer candidate that was included into the block producer sequence as a result of completing the sortition procedure to sign and announce only one block in a specified time slot within a specific round.
9) **Block producer candidate** is any node participating in the quorum that corresponds to the established hardware requirements with the rating above the specified value and mining mode turned on.
10) **Root Assetbox** is an Assetbox that is at the top of a specific mining pool, and all connections in the pool's structure lead to this Assetbox.
11) **Mining period** is a time window of 72 hours.
12) **Mining pool** is one or more Assetboxes that participate in Consensus building mining, the connection among which was established through special

transactions and that form a structure, which functions in accordance with rules and technical protocols of Consensus building mining. The connection among the Assetboxes of the mining pool is called a graph edge of social connections of a specific miner. The graph edge does not have any limitations regarding the number of graph edges of the nodes below.

13) **Mining cycle** is a time window that includes three mining periods when powers (base and social) are calculated and saved for each Assetbox of the mining pool, as well as blocks are created and verified with subsequent crediting of remuneration.

14) **Median** (from medieval Latin “medianus”, from “medius” — mid) in mathematics is a value denoting a sample (i.e. a set of numbers). If all the elements of the sample are different, the median is a value greater than one half of the sample and lower than the other half. In a more general sense, the median can be determined by arranging the elements of the sample in ascending or descending order and taking the middle element.

15) **Assetbox power** is a parameter of a miner’s Assetbox that is calculated as a sum of base and social powers of a miner’s Assetbox.

16) **Sortition procedure** is an automatic process realized as part of the Community PoS consensus, the purpose of which is to form a sequence of block producers based on the distributed Assetbox powers among block producer candidates that would be the basis for the signing and announcement of blocks by block producers in the following round.

17) **Social power** is a parameter of a miner’s Assetbox that is calculated based on social connections of a miner starting from the second line of the mining pool and below.

18) **Blockchain network node** is a hardware and software complex connected to the blockchain network of the **Bit**bon System that stores blockchain data in part or in full.

19) **Synchronization node** is a blockchain network node that, when connecting to the network, synchronizes with the other nodes by receiving transaction blocks, transactions and related objects from other network nodes, verifying them and storing in the local blockchain storage.

20) **Node participating in the quorum** is any synchronization node, whose network latency to connect to the nodes that participate in the quorum, is lower than the threshold.

21) **Level of the mining pool** is a parameter of a miner's Assetbox that depends on the total number of **Bit**bon accounting units in the Assetbox of a miner and all Assetboxes in the first line of the mining pool: the more **Bit**bon accounting units, the higher the level. Consensus building mining in the **Bit**bon System envisions 100 levels.

2. All the other terms used in this Appendix shall be interpreted in accordance with the terms and definitions listed in the **Bit**bon System Public Contract in the Appendix "Terms and Definitions in the **Bit**bon System".

Chapter 2. Subject and Structure of the Appendix

Article 2. Subject of the Appendix

1. This Appendix regulates relations between **Bit**bon System Users that arise when engaging in mining in the **Bit**bon System.
2. This Appendix establishes the fundamental principles and order for implementing mining in the **Bit**bon System, specifies the status of a **Bit**bon System Miner and regulates his/her rights and duties.

Article 3. Structure of the Appendix

1. This Appendix contains a recital, contents, **sections**, which consist of **chapters**, which consist of **articles**, which include **parts** and **paragraphs**.
2. The structure of this Appendix envisions footnotes, links to the Clauses of the **Bit**bon System Public Contract, as well as to separate Appendices, which are an integral part of the **Bit**bon System Public Contract.

SECTION 2. MAIN BODY

Chapter 3. Concept of Mining in the Bitbon System

Article 4. Mining in the Bitbon System

1. Mining in the **Bit**bon System is a type of activity aimed at supporting and developing the decentralized execution environment of the **Bit**bon System.
2. A **Bit**bon System User that participates in mining in the **Bit**bon System is a **Bit**bon System Miner.
3. A **Bit**bon System Miner receives remuneration for participating in mining in accordance with this Appendix.
4. The concept of mining in the **Bit**bon System is based on the effectiveness of a **Bit**bon System Miner's activity as a participant in the decentralized ecosystem, who is interested in its development, reliability and security.
5. Mining is a service of the **Bit**bon System and is available only to **Bit**bon System Participants.

Article 5. Mining Methods in the Bitbon System

1. The **Bit**bon System envisions two types of mining: Consensus building mining and Infrastructure building mining.
2. Consensus building mining is one of the types of mining in the **Bit**bon System, where each **Bit**bon System Participant in the status of a **Bit**bon System Miner provides **Bit**bon accounting units from his/her Assetbox for voting and subsequent signing and announcement of transaction blocks in the blockchain network of the **Bit**bon System.
3. Consensus building mining is implemented based on the Community PoS (Community Proof-of-Stake) consensus building algorithm.
4. Infrastructure building mining is one of the types of mining in the **Bit**bon System, using which each **Bit**bon System Participant in the status of a **Bit**bon System Miner provides his/her computing and telecommunication resources of appropriate quality and with appropriate speed of the Internet channel, CPU time and amount of memory for long-term data storage in order to ensure the functioning of the decentralized execution environment of the **Bit**bon System.

Chapter 4. Mining Fund

Article 6. Concept of the Mining Fund

1. Mining Fund is an integral component of the **Bit**bon System, the assets of which are expressed exclusively in **Bit**bons stored in the Assetbox number (hash) 0x82ccf67061e2f11c3a317f2799ec0b119e96b5b0 and formed out of sources that do not contradict the **Bit**bon System Public Contract.
2. The objective of the Mining Fund is to provide a mechanism that allows accumulating incoming **Bit**bon accounting units and distributing them among **Bit**bon System Miners based on the mining method(s) chosen by each miner, in accordance with Clause 61 of the **Bit**bon System Public Contract.
3. Based on Appendix No. 3 to the **Bit**bon Protocol “Agreement on Provision of Services of Distributing the Right of Access to the **Bit**bon System”, 30,000,000.00 **Bit**bon accounting units were transferred from the **Bit**bon System Capitalization Fund to the Mining Fund to support Consensus building mining and Infrastructure building mining in order to optimize the resources related to the participation of miners in supporting and developing the decentralized execution environment of the **Bit**bon System.

   Every mining period (72 hours), a certain number of **Bit**bon accounting units is allocated from the Mining Fund for subsequent distribution among **Bit**bon System Miners as remuneration.

Article 7. Methods for Adding Funds to the Mining Fund

1. The **Bit**bon System envisions the following methods for adding funds to the Mining Fund:
   1) in accordance with Clause 61 of the **Bit**bon System Public Contract, 50% of the commission for transferring digital assets within the **Bit**bon System are allocated to the Mining Fund;
   2) in accordance with Clause 61 of the **Bit**bon System Public Contract, 10% of the number of **Bit**bon accounting units received by the **Bit**bon System Capitalization Fund in the process of Obventing over a certain time period are allocated to the Mining Fund.
2. The list of ways to add funds to the Mining Funds established by the **Bit**bon System Public Contract, as well as by this and other Appendices, is not limiting.

Article 8. Principles of Distributing Bitbons From the Mining Fund

1. The activity of miners launches the mechanism for distributing remuneration, which is based on the redistribution of **Bit**bon accounting units in the **Bit**bon System from the Assetbox of the Mining Fund to the Assetboxes of miners.
2. **Bit**bon accounting units are redistributed from the Mining Fund among **Bit**bon System Miners that participate in Consensus building mining and **Bit**bon System Miners that participate in Infrastructure building mining equally. Therefore, the total remuneration of Consensus building mining participants will be equal to the total remuneration of Infrastructure building mining participants.
3. The process of distributing remuneration among **Bit**bon System Miners is of cyclic and endless nature.
4. The system for distributing remuneration for mining in the **Bit**bon System is built in a way that would motivate miners to create and develop their own mining infrastructure, which, in turn, contributes to the increase in reliability of the decentralized execution environment of the **Bit**bon System.

Chapter 5. Bitbon System Miner

Article 9. Rights and Duties of a Bitbon System Miner

1. A **Bit**bon System User in a status of a **Bit**bon System Miner has general rights and duties of a User, as well as special rights of a miner that are specified in the **Bit**bon System Public Contract, Appendix “Policy of Rights and Freedoms of **Bit**bon System Users” and this Appendix.
2. A **Bit**bon System Miner shall not violate the rights of third parties and/or the current legislation, and/or the norms of international law by participating in mining in the **Bit**bon System.
3. A **Bit**bon System Miner shall participate in mining following the terms and conditions established by the **Bit**bon System Public Contract and this Appendix.

Article 10. Remuneration of a Bitbon System Miner

1. A **Bit**bon System Miner receives remuneration for supporting the operation of the **Bit**bon System, developing the community of miners and the **Bit**bon System as a whole.

2. Remuneration of a **Bit**bon System Miner depends on the amount and quality of the resources engaged by each **Bit**bon System Miner.
3. Remuneration of a miner is expressed exclusively in **Bit**bons.
4. The main chronological unit used for calculating remuneration of a **Bit**bon System Miner is a mining period, which is 72 hours.
5. Remuneration of a **Bit**bon System Miner for participating in Consensus building mining depends on the number of **Bit**bon accounting units engaged in Consensus building mining and on the scale of the structure of social connections of the mining pool formed by this miner.
6. A **Bit**bon System Miner accepts remuneration for participating in Consensus building mining using One Space. Until the launch of One Space, a **Bit**bon System Miner accepts remuneration for participating in Consensus building mining in the Bit Trade account (https://www.bit.trade/).
7. The maximum possible remuneration distributed among all Consensus building mining participants from the Mining Fund is 13,900.00 **Bit**bon accounting units for one mining period (72 hours).
8. The power of a miner’s Assetbox is the indicator that characterizes the amount and quality of the resources engaged by a **Bit**bon System Miner in Consensus building mining, which directly affects the size of a miner’s remuneration.
9. The desired size of remuneration for Consensus building mining will be achieved over 10 mining periods when an Assetbox connects to the mining pool.
10. Remuneration of a **Bit**bon System Miner for participating in Infrastructure building mining depends on the technical properties and features of the resources provided by a miner, including the quality and speed of the Internet channel, CPU time and the amount of memory for long-term data storage.

SECTION 3. CONSENSUS BUILDING MINING IN THE BITBON SYSTEM

Chapter 6. Consensus Building Using the Community PoS Algorithm in the Blockchain Network of the Bitbon System

Article 11. Main Idea of Community PoS

1. The main idea of Community PoS lies in organization of a community of Users in the status of a miner by uniting their Assetboxes into mining pools.

2. Miners provide their **Bit**bon accounting units in their Assetboxes for automatic distribution of the powers of these Assetboxes among the nodes of the blockchain network of the **Bit**bon System in order to carry out the voting procedure to form the sequence of block producers, which will sign and announce blocks.
3. **Bit**bon System Miners can attract new Users in order to develop the community of miners. Each attracted User provides **Bit**bons from his/her Assetboxes to form a mining pool in order to increase its power.
4. Each new miner automatically participates in validating blocks generated by other community members, as well as in forming new blocks.
5. Each new miner lowers the chance of malicious nodes entering the group of block producers, while at the same time increasing the requirements for hardware resources and the number of **Bit**bons that the hacker must have in order to carry out an attack on the network.
6. The increase in the number of miners leads to an increase in the ability to withstand attacks on the blockchain network of the **Bit**bon System making any type of attack unlikely.
7. In order to increase the level of decentralization, reliability, transparency and security of the **Bit**bon System, further development of the Community PoS consensus algorithm is envisioned in accordance with the development stages described in the **Bit**bon System Roadmap.
8. Organization of the **Bit**bon System blockchain infrastructure based on the Community PoS consensus gives an opportunity to build a **Bit**bon System Decentralized Autonomous Community, social, legal, architectural and technical solutions of which will allow for a reasonable and quick reaction to challenges of the modern world and changes of conditions without decreasing the quality of services of this system.

Article 12. Concept of Community PoS Consensus

1. The main goal of the Community PoS consensus is to provide true decentralization of the processes of announcing, verifying and storing data of the distributed ledger with a high level of performance of storage network and guaranteed short wait time of transaction confirmation.
2. The achievement of the goal of Community PoS consensus is ensured by:
    1) Using ways of preliminary block production sequence approval by block producers to prevent forks and block collision;

2) Centralizing the network at the moment of block formation by the network node in accordance with the block formation sequence;

3) Introducing a strict synchronized sequence diagram of network node operation to ensure the exact determination of the state of the blockchain network;

4) Introducing the network state “service denied” to register the value of the uncertainty period when business offer cannot qualify the state of the operation carried out by the nodes of the blockchain network;

5) Mutual synchronization of network nodes to ensure adherence to the voting and block formation sequence diagram;

6) Using a fixed maximum amount of time for processing the transaction (with its cancellation in case of failure to complete it within the given timespan);

7) Introducing three types of network node operation protocols:

- Protocol for quorum control and ensuring time synchronization of nodes that is essentially a background process based on the poll of a blockchain network and keeps the information on the availability of the nodes, which can participate in the voting and block formation procedures, up to date;
- Sortition protocol, within which the network node sequence is formed, according to which network nodes will act as block producers;
- Block formation protocol, which includes the creation of the block by the block producer, its verification by other network nodes and a node rating system, which provides the accuracy of carrying out the block producer functions by the network nodes;

8) Using the algorithm of the random miner stake (Assetbox powers) distribution among the network nodes prior to sortition of the nodes, the rating of which allows them to be candidates for block producers, thereby increasing the difficulty of predicting the sequence of block producers;

9) The mechanism of decentralized sortition when determining the sequence of taking on the role of block producers by the nodes, which is conducted by sorting the list of nodes according to the powers allocated in favor of these nodes, defining the sequence limits and observing the nodes’ compliance with the rules of participating in the formed sequence of block producers;

10) A decentralized verification of the block by all the nodes of the blockchain network and sending out the message on the increase or decrease of the rating of the block producer that generated the block depending on the verification results.

Article 13. Network Nodes and Their Role Within Community PoS Consensus

1. Network node is a hardware and software complex connected to the blockchain network of the **Bit**bon System that stores all blockchain data or part of it. Network node of the **Bit**bon System's blockchain can have the following roles: synchronization node; node participating in the quorum; block producer candidate; block producer.
2. Synchronization node is a blockchain network node that, when connecting to the network, synchronizes with the other nodes by receiving blocks, transactions and objects related to them from the other network nodes, verifying them and storing in the local blockchain storage. Synchronization of the node time is conducted in accordance with the timestamp of the last valid block and the latency metric to the block producer that formed this block, as well as the timestamps from the other network nodes. After synchronization, the node conducts the verification and storage of transactions and blocks it receives. If the metric of distributing the block for this node is less than the specified value, then this blockchain network node must accept transactions from client applications for processing and, after verifying them, rebroadcast them to all the other network nodes. Otherwise, or if the quorum of the blockchain network nodes has not been reached, the node does not accept transactions for processing, displaying the "service denied" error.
3. Node participating in the quorum is any synchronization node, whose latency for nodes that are part of the quorum does not exceed the threshold. To implement the protocol of operation of the Community PoS consensus in the blockchain network, the number of nodes has to be higher than the size of the quorum determined by the **Bit**bon System Operators (no less than 2/3 of the number of blockchain network nodes). The node participating in the quorum takes part in the rating formation procedure in accordance with the node rating system. If, while processing transactions and blocks, the quorum participant notices a violation of the processing rules, they send all the network nodes the relevant message on the decrease of the rating of sources of invalid data. If the data is valid, then the message contains the information on the increase of the rating of the relevant block producers.
4. Block producer candidate is any node participating in the quorum with the rating above the specified value if it has the mining mode turned on. In this case, such a

node will be included in the procedure of distributing powers (stakes) of the pool of Assetboxes of the community of miners.

5. Block producer is a block producer candidate, which was included in the block producer sequence as a result of conducting the sortition to sign and announce only one block in the specified time period (timeslot).

Article 14. Supporting the Sortition System

1. To eliminate the threats of the **Bit**bon System centralization and to automate the voting procedure of miners within the limits of participating in Consensus building mining of the **Bit**bon System, there is a procedure of automatic redistribution of stakes (Assetbox powers) among block producer candidates.

2. In order for an Assetbox to participate in automatic voting, the power of the miner's Assetbox must be transferred to the mining pool using a method specified in part 1 of article 25 of this Appendix.

3. Assetbox powers that participate in automatic distribution randomly associate among all the nodes of the blockchain network of the **Bit**bon System with the corresponding rating, which meet the relevant requirements for the performance and quality of the connection channel (node in the role of a block producer candidate) at the time of voting.

Article 15. Sortition Procedure

1. The sortition procedure is a process aimed at forming the sequence of block producers based on the Assetbox powers distributed among the block producer candidates, according to which said block producers will sign and announce blocks in the next round.

2. The sortition procedure is conducted in accordance with the voting and block formation sequence diagram and contains the rounds, the duration of which is equal to the number of block producers multiplied by the 1-second time interval.

3. The number of block producers is determined by **Bit**bon System Operators.

4. The sortition procedure starts after the end of each round and is conducted over the entire duration of the round. The final block of the round or the message of the timestamp instead of it, if this timeslot had no transactions, can serve as an indicator of the end of the round.

5. Voting as part of the sortition procedure is carried out in the following order:

1) Within the first 2 seconds, every node, based on the Assetbox powers distributed among block producer candidates, must randomly form a list of possible positions (sequence) from 1 to n for each block producer candidate node with power higher than the lower limit and a corresponding rating and then send the hash of this list (sequence) to all the nodes participating in the quorum;

2) Out of the nodes that can be included in the sequence, the block producer, which is the last to form a block in this round, is excluded;

3) Sequence elements with identical positions are not allowed;

4) It is forbidden to include 2 elements with the same identifier in the sequence;

5) On the 5th second, each node participating in the quorum, based on the number of votes for each unique sequence hash, must determine whether or not the sequence it formed collected the maximum amount of votes. If not, the node goes into the standby mode awaiting the block producer sequence. Otherwise, the node checks if the number of votes exceeds or equals 2/3 of the quorum. If the number of votes exceeds or equals 2/3 of the quorum, the node announces the sequence. If not, the node announces the message about the sequence forming error and goes into the standby mode until the start of the next round;

6) Each node receives either the block production sequence or the error from the other nodes by the 9th second.

6. Each node, regardless of its role, verifies the received blocks in accordance with the calculated/received sequence of block producers.

7. The block producer candidate specified in the resultant sequence takes on the role of a block producer during its timeslot.

Article 16. Block Formation

1. A block is formed by a block producer out of transactions that are in its transaction pool with the timestamp of the latest transaction in the last valid formed block and the moment of block formation in the next timeslot, which it serves according to the rules:

1) If no transactions were received in the processed timeslot, the block will not be formed, but all the nodes will be sent the timestamp of the ending of the timeslot;

2) The node in the role of a block producer forms a block based on the hash code of the previous valid block out of transactions in its transaction pool;

3) During the round, the block producer can form a block only once;
4) The block producer cannot under any circumstances form 2 blocks in a row;
5) All the nodes (including block producers in this round) take on the role of the synchronization node receiving transactions, carrying them out and checking the received blocks:
   - If the block is valid, then both it and the transactions it includes are registered in the storage;
   - If the block is invalid, the node ignores it and awaits a valid block with the same number;
6) If a block producer was unable to verify the previous block at the time of serving its timeslot, it forms a new one with the same number, which includes all transactions in the transaction pool, with the ones that arrived in the previous timeslots, filtered by the time of creation (excluding the ones that ran out of processing time).

2. The block producer sends out a message on the decrease of the rating of the previous block producer.

Article 17. Node Rating

1. The rating of each node is formed through messages that are sent out across the network by all the nodes of the **Bit**bon System's blockchain as a result of verifying another block formation.
2. The changes in the rating are accepted by all the network nodes in favor of all the network nodes, in particular in favor of the block producer, and are applied after a time period equal to the duration of three timeslots after block formation, on condition that the number of messages exceeds or equals the quorum (at the same time, the number of messages from each node is being monitored). Only one message from a node for each block is included.
3. The main factors that influence the rating of the nodes include the following:
   1) Rating is increased:
      - For the correctly formed block;
      - For fulfilling the terms of participating in the quorum (issued by a **Bit**bon System Operator);
      - If a block producer formed at least one block during the day and did not receive the rating decrease;
   2) Rating is decreased:

– If a block producer included more than 10 transactions related to the previous timeslot;
– If a block producer formed a block in a timeslot that is not its own;
– If a block producer did not form and send the package with a timestamp in its timeslot;
– If the node sent more than 2 messages on the increase/decrease of the rating for one block (pause);
– If the node broadcasted an invalid transaction or the same transaction once again (for each repetition);
– Rating reduction to zero if a block producer formed an invalid block (included an invalid transaction).

4. The calculation of the rating of the network node can also be affected by other events and metrics.

Chapter 7. Scientific and Mathematical Substantiation of the Global Probability Model of the Block Producer Sequence Formation Process

Article 18. Distribution of Assetbox Powers Among Network Nodes, Block Producer Candidates

The source data is represented by the group of Assetboxes $e=\left[e(1),e(2),...,e(N)\right]$. Each Assetbox $e(j)$ is characterized by a unique identifier a out of the multitude A and a power (positive numeric characteristic) $b(j)$

$$e=\left[\left(a(j),b(j)\right)\right],$$

$$j=1,2,...,N,$$

where N is a number of Assetboxes participating in Consensus building mining.

Assetbox powers are transferred randomly (quasirandomly) in favor of a set of blockchain network nodes (block producer candidates). The power of each Assetbox is transferred to only one node. Depending on the state of the group $e=\left[\left(a(j),b(j)\right),\ j=1,2,...,N\right]$, there is a number of positive probabilities

$$\left[p^i[j](e), i=1,...,n; j=1,2,...,N\right]$$

of transferring the power of j Assetbox to the i block producer candidate. For each Assetbox, the sum of probabilities of transferring the power of this Assetbox to a specific node, a block producer candidate, for all the nodes, equals one

$$\sum_{i=1}^{n} p^i[j](e)=1,\ j=1,2,...,N.$$

The probability of distributing powers of the Assetbox group with the numbers $J^{[l(i)]}=\left[j(1),j(2),...,j(l(i))\right]$ in favor of the i node equals

$$P^i(J^{[l(i)]})=p^i(j^i(1),j^i(2),...,j^i(l(i)))=p^i[j^i(1)](e)p^i[j^i(2)](e)...p^i[j^i(l(i))](e).$$

The probability of transferring powers of only these Assetboxes to the i node equals

$$P^i[J^{[l(i)]}.]=P^i(J^{[l(i)]})\exp[\sum_{j\notin J^{[i]}}\ln[1-p^i[j](e)]],i=1,2,...,n.$$

If the i node receives the precise set of Assetbox powers $J^{[l(i)]}(i)$, and the other nodes, block producer candidates, receive other, unrelated sets of Assetbox powers, while combining such sets with all the nodes amounts to the entire multitude of Assetbox powers, the probability that all the nodes will receive the powers of their own unique sets of Assetboxes is defined as a product of probabilities for all the blockchain nodes

$$P^i(J^{[L(i)]})=p^i(j^i(1),j^i(2),...,j^i(l(i)))=p^i[j^i(1)](e)p^i[j^i(2)](e)...p^i[j^i(l(i))](e),$$

which means

$$P[J^{[L(1)]}(1),...,J^{[L(n)]}(n)]=P^1(J^{[L(1)]})P^2(J^{[L(2)]})...P^n(J^{[L(n)]}).$$

Article 19. Forming a Block Producer Sequence out of Block Producer Candidates

Each node with its own set of Assetbox powers out of the total set of n blockchain network nodes can be selected into the block producer group out of k nodes ($k<n$).

The probability $p(i)[H]$ of choosing the i node into the selected group depends on the state of the nodes $H=(E^1,E^2,...,E^n)$ where the state of the nodes is determined by the Assetbox powers distributed in their favor

$$E^i=\left[e\left(j^i(1)\right),e\left(j^i(2)\right),...,e\left(j^i(l(i))\right)\right],i=1,2,...,n.$$

$V(i)$ is a random value that shows the number of entrances of the i node into the chosen group, which means that $V(i)$ is an indicator of the i node entering the chosen group, $i=1,2,...,n$, which receives the values of 0 or 1. $V=\sum_{i=1}^{n} V(i)$ denotes the number of nodes in the chosen group.

The probability of the i node entering the chosen group of block producers k equals

$$P(i;k)=P\left(\frac{V(i)=1}{V=k}\right)$$

the conditional probability of the i node entering the chosen group on condition that the number of nodes in the chosen group equals k.

This conditional probability is determined as a relation of the probability of the product $P(V(i)=1,V=k)$ of these two events to the probability of the $P(V=k)$ condition.

The probability of the condition equals

$$P(V=k)=\sum_{\left[\{V(i)\},V=k\right]} \exp\left[\sum_{i=1}^{n} \ln\left[p(i)^{(V(i))}\left(1-p(i)\right)^{(1-V(i))}\right]\right]$$

the total of the probability of the products of events of the specific node's membership in a group (chosen or not chosen) of events when the chosen group consists of k nodes.

Then we calculate the probability of the product $P(V(i)=1,V=k)$, i.e. distinguish the summands out of this total, in which $V(i)=1$ and the total of other indicators equals $k-1$. This probability is determined as follows

$$P(V(i)=1,V=k)=p(i)\sum_{[\{V(i)\},V-V(i)=k-1]} \exp\left[\sum_{\substack{1\le r\le n\\ r\ne i}} \ln\left[p(r)^{(V(r))}\left(1-p(r)\right)^{(1-V(r))}\right]\right].$$

The probability of the i node entering the chosen group of block producers k equals

$$P(i;k)=P(V(i)=1/V=k)$$

the conditional probability of the i node entering the chosen group on condition that the number of the nodes in the chosen group equals k and

$$P(i;k) = P(V(i)=1/V=k) = \frac{P(V(i)=1, V=k)}{P(V=k)}$$

or

$$P(i;k) = \frac{p(i) \sum\limits_{[\{V(i)\}, V-V(i)=k-1]} \exp\left[\sum\limits_{\substack{1 \le r \le n \\ r \ne i}} \ln\left[p(r)^{(V(r))} (1-p(r))^{(1-V(r))} \right] \right]}{\sum\limits_{[\{V(i)\}, V=k]} \exp\left[\sum\limits_{i=1}^{n} \ln\left[p(i)^{(V(i))} (1-p(i))^{(1-V(i))} \right] \right]},$$

where

$$p(i) = p(i)[H].$$

Article 20. Events of the Repeated Formation of the Block Producer Sequence

The conditional probability of the i node entering the chosen group of block producers at the r position on condition that the size of the group of block producers is k nodes equals $\frac{1}{k}$.

The conditional probability of repeating the fragment of the sequence out of the determined w nodes in the group of block producers of k nodes on condition that the nodes, which participated in the selection procedure are already included in the sequence equals the probability

$$P(w,k) = \frac{1}{k(k-1)(k-2)...(k-w+1)}$$

that this sequence fragment is positioned at the beginning of the sequence of block producers multiplied by the number of positions in the sequence $(k-w+1)$, in which this sequence fragment can be placed, in the group of block producers of k nodes

$$P^{(r)}(w,k) = (k-w+1)P(w,k) = \frac{1}{k(k-1)...(k-w+2)}.$$

The probability of the condition of forming the $i(1), i(2), ..., i(w)$ sequence fragment equals the produce of the probabilities $p(i(1)), p(i(2)), ..., p(i(w))$. The probability $p^{(r)} = p^{(r)}(i(1), i(2), ..., i(w))$ of the sequence fragment ($i(1), i(2), ..., i(w)$) occurring at another step in the group of block producers equals the produce of the conditional probability $P^{(r)}(w,k)$ and the probability of the condition $p(i(1))p(i(2))...p(i(w))$ and equals

$$p^{(r)} = P^{(r)}(w,k)p(i(1))p(i(2))...p(i(w)) = \frac{p(i(1))p(i(2))...p(i(w))}{k(k-1)...(k-w+2)}.$$

Article 21. Evaluation of the Probability of Stationarity of the Results of the Block Producer Sequence Formation Process Regarding the Stages of Distribution of Assetbox Powers and Block Producer Sequence Formation

As the evaluation of the solution options, we can determine the number of possible ways to divide the multitude $A = \{a^{(1)}, a^{(2)}, ..., a^{(N)}\}$ out of N elements into the unrelated subsets $A^{(i)}$, $A = A^{(1)} + A^{(2)} + ... + A^{(K)}$, where $i = 1, 2, ..., K$ and $K < N$, which equals K^N. The first element $a(1)$ of the multitude A can enter any of the subsets K, the second element $a(2)$ of the multitude A can enter any of the subsets K ... and so on N times. The division of the source multitude A into the unrelated subsets $A^{(i)}$, where $i = 1, 2, ..., K$, is a result of the stage of distributing Assetbox powers in favor of network nodes, block producer candidates.

Now let us calculate the power distribution.

This way, each subset $A^{(i)}$ takes on the condition E^i that is defined by the elements $a(i(s))$, $s = 1, 2, ..., l = l(i)$ within it,

$$E^i = \left[a(i(1)), a(i(2)), \ldots, a(i(l))\right],\ i = 1, 2, ..., K, \text{ a } \sum_{i=1}^{K} l(i) = N.$$

Generally, the states of subsets will change. The result of implementing the power distribution stage is shown as a number of shifts N_{sh} of subsets of the multitude A

(assuming that the shift, in this case, means the arrangement $A^{(i)}$ by the value of the condition E^{i}), which equals

$$N_{sh} = K!$$

Each shift is the source data for the process of forming the sequence of block producers, with the help of which the privileged subsets $A^{(v)}$ are selected out of $A^{(i)}$ subsets, where $v = 1, 2, ..., \Pi$. The total number of selections N_{select} of privileged unordered subsets out of block producer groups equals

$$N_{select} = \frac{K!}{\Pi!(K-\Pi)!}.$$

Generally, the probability of the element $e(i)$ entering a specific subset A^{j} (event X), for example for the first $j = 1$, equals $P(X) = \frac{1}{K}$. The probability of selecting the subset A^{1} into the privileged group (group of block producers) on condition that the event X has occurred (in the subset A^{1} there is an element $e(i^{1})$, event Y) equals $P(Y/X) = \frac{1}{K}$. The probability of the repeated entering by the element of the sequence, which will then enter the privileged group into the same spot equals

$$P(XY) = P(Y/X)P(X) = \frac{1}{K^{2}}.$$

u elements were selected into the subset and this subset entered the privileged group into a specific position in a group of block producers, the event X will be the selection of the same number u of elements into the same subset during the next step, and the event Y is a selection of this subset into the privileged group into the same position. We calculate

$$P(X) = \frac{1}{K^{u}},\ P(Y/X) = \frac{1}{K}$$

and

$$P(XY) = P(Y/X)P(X) = \frac{1}{K^{(u+1)}}.$$

Based on the above-mentioned, we determine the value of the probability of distributing Assetbox powers into a specific network node and the probability of distributing a specific network node, a block producer candidate, into a privileged group of nodes that produce blocks.

The probability of the events described above will be low with high values of variables.

Chapter 8. System of Consensus Building Mining

Article 22. Concept of Consensus Building Mining in the Bitbon System

1. The concept of Consensus building mining in the **Bit**bon System is based on the effectiveness of the miner's activity as a participant in a decentralized ecosystem who is interested in its development, reliability and security.
2. In Consensus building mining, the person and his/her resources, which include social connections and **Bit**bon accounting units, acquire value.
3. Consensus building by participating in Consensus building mining is the priority of the entire community of the **Bit**bon System.
4. By allocating their **Bit**bons for mining, **Bit**bon System Participants display their trust to the System itself. The **Bit**bon System, by means of the Mining Fund as one of its components, distributes remuneration for the trust shown in **Bit**bon accounting units and social connections of each miner.
5. The objective of Consensus building mining is to support and develop the decentralized execution environment of the **Bit**bon System.
6. A **Bit**bon System User participates in Consensus building mining using the functionality of the components and services of the **Bit**bon System.
7. In order to participate in Consensus building mining, **Bit**bon System Participants, miners, provide **Bit**bon accounting units in their Assetboxes for automatic distribution of powers of such Assetboxes among the nodes of the blockchain network of the **Bit**bon System for voting.
8. When implementing Consensus building mining using the Community PoS algorithm in the blockchain network of the **Bit**bon System, miners accumulate a certain number of **Bit**bon accounting units in their Assetboxes and connect them to the mining pool.
9. The power of the pool is calculated based on **Bit**bon accounting units in the Assetboxes of miners.
10. The powers of mining pools participate in sortition procedure in order to form a

sequence of network nodes that will sign and announce blocks.

11. Any number of Assetboxes of a specific miner can participate in Consensus building mining.

Article 23. Stages of Launching Consensus Building Mining in the Bitbon System

1. July 15, 2020 is the official launch date of Consensus building mining in the **Bit**bon System (1st stage).

2. The first stage includes the starting and the main periods.

3. The starting period of Consensus building mining begins when 1,000.00 **Bit**bon accounting units are distributed among all miners that participate in Consensus building mining.

4. For the duration of the starting period of Consensus building mining, there is a stage-by-stage increase in remuneration by 100.00 **Bit**bon accounting units for each mining period (72 hours).

5. The starting period of Consensus building mining will end by decision of the **Bit**bon System Operator, SIMCORD LLC, or when the remuneration reaches 13,900.00 **Bit**bon accounting units for one mining period.

6. The main period of Consensus building mining will begin once the starting period ends.

7. The maximum size of remuneration may be increased during the main period.

8. The second stage of launching Consensus building mining in the **Bit**bon System allows **Bit**bon System Participants to install and launch the software of a block producer node of the blockchain network of the **Bit**bon System on personal resources to participate in creating transaction blocks.

Article 24. Mining Pool Structure

1. Mining pool is one or more Assetboxes that participate in mining, the connection between which was established through special transactions and which form a structure that operates according to the rules and technical protocols of Consensus building mining.

2. Each mining pool has a root Assetbox. All Assetbox directly connected to the root Assetbox are called the first connection line.

3. Mining pools can be of several types:

   1) mining pool with one Assetbox that connected to mining;

   2) mining pool with the 1st connection line;

3) mining pool with the 2nd and more connection lines.

4. A mining pool can be formed out of Assetboxes of various miners and/or several Assetboxes of the same miner.

Article 25. Connecting to Consensus Building Mining

1. In order to connect to Consensus building mining, 0.0001 **Bit**bon accounting units must be transferred to the Assetbox that is being connected to with the comment **/Mining**.

Article 26. Philosophy of Miner's Trust in the Bitbon System

1. The trust of a miner to the objectives and values of the **Bit**bon System is realized using one of three levels of trust.
2. The trust of a miner to the **Bit**bon System affects the size of his/her remuneration.
3. The 1st level of trust means the personal trust of a miner to the values of the **Bit**bon System. This level of trust is expressed in **Bit**bon accounting units in the miner's Assetbox. The **Bit**bon System considers this level of trust to be loyal and distributes the remuneration that corresponds to this level.
4. The 2nd level of trust means the connection of new **Bit**bon System Participants by a miner to the first line of his/her mining pool. This mining pool uses more **Bit**bon accounting units in mining and consists of the root Assetbox and the total number of Assetboxes of all pool participants, the first connection line. The **Bit**bon System considers the pool of this miner to be the one with the high level of loyalty and distributes the remuneration that corresponds to this level.
5. The 3rd level of trust means that the pool participants invited by the miner also invite new participants to their mining pools, which became a part of the initial mining structure. This mining pool has social connections of a larger scale and consists of the root Assetbox, miner's Assetboxes of the first line and miner's Assetboxes of the second line and lower. The **Bit**bon System considers the pool of this miner to be the one with an exceptionally high level of loyalty and distributes the remuneration that corresponds to this level.

Article 27. Assetbox Power

1. The main parameter of the root Assetbox in Consensus building mining is its power calculated as the sum of base and social powers of the miner's Assetbox.

2. Assetbox power is measured in power units.
3. Assetbox power is the key indicator used to calculate miner's remuneration.

Article 28. Individual Assetbox Power

1. Each Assetbox has an individual power that depends on the number of **Bit**bon accounting units stored in the miner's Assetbox and is equal to 25% of the balance of this Assetbox.

Article 29. Power Increase

1. The power increase process starts from the second mining period after an Assetbox connects to the mining pool. Over the course of 10 mining periods, the Assetbox power increases until it reaches its nominal value.
2. If you add funds to the Assetbox that participates in mining while increasing the power, then, starting from the next period after that, a parallel process of increasing the power of this Assetbox takes place.
3. If, during the power increase, the balance of accounting units in the Assetbox that participates in mining decreases, the increase in power is calculated and performed according to the number of **Bit**bon accounting units remaining in the Assetbox, not to its initial balance.
4. **Bit**bon accounting units that are sent to the miner's Assetbox from the Mining Fund as remuneration are engaged in mining right after the miner receives them without going through the power increase process.
5. When the root Assetbox is increasing its power, there may be no power to calculate remuneration for the root Assetbox for several mining periods if funds are withdrawn from the Assetboxes of the 1st line.

Article 30. Base Assetbox Power

1. Base Assetbox power is formed when other Assetboxes connect to the miner's Assetbox.
2. Base power is determined by the individual power of the miner's Assetbox and Assetbox power of miners of its first connection line.

Article 31. Social Power of Assetboxes and Interlevel Difference

1. Social power of an Assetbox is formed using social connections of a miner starting

from the second line and lower.

2. All Assetboxes of the mining pool are divided into levels. The level depends on the base balance of your mining pool: the more **Bit**bon accounting units there are in the miner's Assetbox and its first line, the higher the level of the pool.
3. Consensus building mining has a 100-level scale used to distribute base balances of miners' Assetboxes. The value of the limit of level 100 depends on the median of distributing Assetbox balances in mining. Therefore, the base balance of an Assetbox that it needs to achieve to get level 100 is calculated relative to this median.
4. Assetboxes are divided into levels according to the calculated base balance and the value in **Bit**bon accounting units that needs to be achieved to receive level 100.
5. An interlevel difference of the pool is formed according to the following principle: the bigger the difference between the level of the miner's Assetbox and that of the Assetbox below it in the mining pool, the higher share of social power the Assetbox of this miner will receive.

Article 32. Social Power Blocking

1. If the structure of your mining pool has an Assetbox with the base balance (level) equal to or higher than the base balance of your Assetbox, the blocking of power takes place.
2. If the social power is blocked, the miner's Assetbox loses its social power and does not participate in calculating remuneration for the following mining period in this branch of the mining pool.
3. If the structure of the mining pool contains an Assetbox with the balance lower than 0.001, this Assetbox does not participate in mining and does not receive remuneration, while social connections in the structure of the pool through this Assetbox are maintained, but quality and quantity indicators for it are not calculated.
4. Consensus building mining in the **Bit**bon System envisions a power blocking indicator displayed in the miner's analytical dashboard, which is a tool for managing the levels of base balances of Assetboxes in the mining pool.

Article 33. Mining Cycle

1. A mining cycle contains three mining periods, during which the powers (base and social) are calculated and saved for each Assetbox of the mining pool, and the blocks are being created and verified followed by the crediting of remuneration.
2. Mining cycles for each Assetbox participating in Consensus building mining are

calculated simultaneously.

3. During the 1st mining period, base and social powers for each Assetbox of the mining pool are calculated and saved. The minimum balance throughout the mining period is always used for calculations.
4. During the 2nd mining period, the powers of the Assetboxes that are part of mining pools participate in creating transaction blocks and their subsequent verification.
5. During the 3rd mining period, remuneration for the powers calculated during the first period of the mining cycle is credited to the Assetboxes of miners.
6. When the miner's Assetbox connects to mining, the first mining cycle consists of four mining periods:
   1) the first mining period envisions the inclusion of the Assetbox into the mining pool;
   2) the minimum balance of this Assetbox at the time of its connection is zero, the power increase process will be implemented in accordance with the mining indicators for the second mining period. The Assetbox power will increase over 10 mining periods until it reaches its nominal value;
   3) during the third mining period, the powers calculated for the second period will participate in creating transaction blocks and their subsequent verification;
   4) during the fourth mining period, remuneration will be credited for the powers calculated for the second mining period and that participated in signing transaction blocks and their subsequent verification during the third mining period.
7. Remuneration and the entire mining system are linked to the server time (UTC).

Article 34. Mining Power Protection

1. Mining power protection was developed in order to create the conditions for a stable operation of Consensus building mining and optimal distribution of powers among **Bit**bon System Miners.
2. Mining power protection implies that:
   1) when a mining period ends, i.e. after 72 hours, **Bit**bon transfer operations to the Assetboxes of miners of the **Bit**bon System over the given period are analyzed;
   2) if the Assetbox balance, based on which the power for this mining period is calculated, is lower than for the previous mining period, the power of this

Assetbox is reduced by the difference of powers calculated before and after the decrease in the balance of this Assetbox multiplied by four. The power value that the power of this Assetbox was reduced by will go back to the value that corresponds to the new balance over the course of 10 mining periods: 10% for each mining period;

   3) if the balance reduces during one of the following periods, another mining power protection process is created, which is added to unfinished mining power protection processes that occurred before.

3. The mining power protection process does not cover **Bit**bon accounting units received as remuneration for mining on condition that these **Bit**bons were transferred from the miner's Assetbox during the same period when the remuneration was received (before they start participating in mining in the next mining period).

Article 35. Synergy of Remuneration and Principles of Crediting Remuneration

1. The received remuneration will be credited to the miner's Assetbox in the corresponding mining period. The transaction with remuneration will specify what part of remuneration the miner received for the base power, and what part of remuneration was for social power.

2. If the **Bit**bon System Miner does not accept the transaction with remuneration within 30 days, this transaction is returned to the Mining Fund for further redistribution among participants of Consensus building mining. If the miner does not accept the transaction with remuneration in the specified period, such remuneration cannot be credited again.

3. The main principles of crediting remuneration include the following:

   1) Principle 1. The higher the balances of the Assetboxes that participate in Consensus building mining, the higher the remuneration received by the miner.

   2) Principle 2. Remuneration of a participant in Consensus building mining is proportional to his/her contribution to forming a community of **Bit**bon System Miners.

   3) Principle 3. Mining is a cyclical process, one period of which equals 72 hours. Every 72 hours, all miners receive remuneration for participating in Consensus building mining from the Mining Fund. The size of remuneration directly depends on base and social powers of the miner's Assetbox.

Article 36. Tools of a Bitbon System Miner

1. The **Bit**bon System has the following miner's tools: miner's analytical dashboard; mining pool virtual modeling application; "Adjusted Base Balance of Level 100" chart; "Number of **Bit**bons in Community PoS Mining" chart; "Power of Assetboxes in Mining" chart; "Changes in the Structure of Pools of the Mining Network" chart; miner's calculator; adviser bot.
2. Miner's analytical dashboard is the main tool of a miner that displays detailed information on all Assetboxes in all the lines of the mining pool: base balance, total power, Assetbox level and other data. Miner's analytical dashboard shows expanded and detailed remuneration statistics for participating in Consensus building mining.
3. Mining pool virtual modeling application was created in order to teach the basics and the main principles of Consensus building mining. A set of tools of the application that includes charts and various settings allows for a better understanding of the principles of building mining pools with different combinations of Assetboxes that are part of the mining pool and their balances.
4. The "Adjusted Base Balance of Level 100" chart is a line chart where Y-axis represents the value in **Bit**bon accounting units that needs to be achieved for the Assetbox to get level 100. X-axis represents 90 mining periods.
5. The "Number of **Bit**bons in Community PoS Mining" chart is a line chart where Y-axis represents the total balance of all Assetboxes that participate in mining, and X-axis represents 90 mining periods.
6. The "Power of Assetboxes in Mining" chart is a line chart where Y-axis represents the sum of powers of all Assetboxes that participate in mining, and X-axis represents 90 mining periods.
7. The "Changes in the Structure of Pools of the Mining Network" chart is a line chart that shows the calculated indicator of proximity of the total power of all Assetboxes that participate in mining to the power of an "ideal pool" (theoretically achievable power of all mining pools in the **Bit**bon System).
8. Miner's calculator is one of the main tools developed in order to provide miners with the ability to conduct preliminary calculation of remuneration for participating in Consensus building mining. This application automatically predicts the ways of receiving remuneration based on the entered parameters with the option of choosing the period and one of the three main prediction models:
    1) 1st model: the prediction is made based on the fact that a miner has only his/her own Assetbox, and only its individual power participates in mining;

2) 2nd model: the prediction is made based on the fact that a miner has a connected first line, i.e. base power;

3) 3rd model: the prediction is made based on the fact that a miner has the second line and more, i.e. social power.

9. Adviser bot is a tool created for timely notification of a miner about the key events in his/her mining pool through Telegram messenger. Adviser bot will inform the miner about incoming transactions with remuneration, connection of new Assetboxes to the mining pool, recalculations of levels and powers and so on. The adviser bot provides recommendations on increasing the effectiveness of managing the pool. Messages sent by the bot in the messenger are doubled in the miner's analytical dashboard in a special "Adviser Bot" tab.

Chapter 9. Mathematical Description of Consensus Building Mining

Article 37. Analytical Expressions to Perform a Sequence of Actions Related to Calculating Remuneration for Mining

1. Source Data:

N — number of Assetboxes that participate in mining,

$B(n)$ — balance of Assetbox number n, $n = 1,2,3, \ldots, N$,

$BB(n) = B(n) + B^{(1)}(n)$ — base balance where $B^{(1)}(n) = \sum_{i=1}^{[l^{[1]}(n)]} B(n(i))$ is the sum total of Assetbox balances of its first connection line, $B(n(i))$ is the balance of the i Assetbox of the first line number $n(i)$.

2. Let us calculate the (common value)

B^{avg} — average of balances of the Assetboxes that participate in mining,

$$B^{avg} = \sum_{n=1}^{N} B(n)/N,$$

3. Let us calculate the (individual value) for each Assetbox number n

$b^r(n)$ — relative balance of the Assetbox,

$$b^r(n) = B(n)/B^{avg},$$

4. Let us assign $z > 0$ an influence coefficient of the first connection line and function $f(b^r(n))$ an influence regulator of the first line, by selecting its parameters $\alpha > d > 0, c > 0$.

It sets the value of entering the level of zero Assetboxes to zero.

It depends on the relative balance $b^r(n)$ of Assetbox number n.

It is continuous on the positive semiaxis and $f(0) = 0, f(\infty) = 1$:

$f(x) = [x^\alpha + c * x^d]/(1 + x^\alpha), x \geq 0, \alpha > d > 0.$

5. Based on the total balance $B^{(1)}(n)$ of the first connection line $B^{(1)}(n) = \sum_{i=1}^{[l^{[1]}(n)]} B(n(i))$ for each Assetbox number n, we calculate $R(n)$, the value of bringing Assetbox number n to a certain level (adjusted base balance) determined by the value

$$R(n) = B(n) + z * B^{(1)}(n) * f(b^r(n)),$$

that depends on the balance $B(n)$ of Assetbox number n, as well as the total balance $B^{(1)}(n) = \sum_{i=1}^{[l^{[1]}(n)]} B(n(i))$ of its first connection line. This formula contains:

$z > 0$, an influence coefficient of the first connection line and function $f\left(b^r(n)\right)$, an influence regulator of the first line, which depends on the relative balance of Assetbox number n.

6. The issue of selecting the left boundary of the top (100th) level is solved using the generalized exponential distribution (Weibull distribution).

1) First we need to express the parameter of the generalized exponential distribution through its median.

The generalized exponential distribution is as follows

$$F(x) = 1 - \exp[-(\lambda x)^\alpha], \ x > 0.$$

Let us solve the equation $F(x) = 1/2$. Then, write down an equivalent equation

$$1/2 = 1 - \exp[-(\lambda x)^\alpha].$$

Let us find

$$\exp[-(\lambda x)^\alpha] = 1/2$$

and

$$\lambda x = (\ln 2)^{(1/\alpha)}.$$

Therefore

$$x^{(med)} = (\ln 2)^{(1/\alpha)}/\lambda.$$

2) The next step is to express the quantile for the probability 0.99 through the parameter of the exponential distribution.

Let us find the left boundary of level 100. We solve the equation

$$F(x) = 0.99,$$

or

$$0.99 = 1 - \exp[-(\lambda x)^{\alpha}],$$

or

$$\exp[-(\lambda x)^{\alpha}] = 0.01.$$

Therefore

$$\lambda x = (\ln 100)^{(1/\alpha)}$$

and

$$x^{(0.99)} = (\ln 100)^{(1/\alpha)}/\lambda.$$

From the relation

$$x^{(med)} = (\ln 2)^{(1/\alpha)}/\lambda$$

we find

$$\lambda = (\ln 2)^{(1/\alpha)}/x^{(med)}$$

and add it to the expression

$$x^{(0.99)} = (\ln 100)^{(1/\alpha)}/\lambda.$$

We get

$$x^{(0.99)} = (\ln 100)^{(1/\alpha)}/\lambda = x^{(med)}(\ln 100/\ln 2)^{(1/\alpha)} = x^{(med)} * [(\log 100)/(\log 2)]^{(1/\alpha)},$$

or

$$x^{(0.99)} = x^{(med)}[(\log 100)/(\log 2)]^{(1/\alpha)},$$

or

$$x^{(0.99)} = x^{(med)}[(\log 100)/(\log 2)]^{(1/\alpha)} = x^{(med)}(2/\log 2)^{(1/\alpha)}.$$

The left boundary of level 100 is expressed through the median of the exponential distribution as

$$x^{(left)}(100) = x^{(0.99)} = x^{(med)}(2/\log 2)^{(1/\alpha)}.$$

3) The next step is to determine the exponent of the distribution.

In order to determine the exponent of the exponential distribution, we use the expression for the expected value of a random variable with this distribution:

$$F(x) = 1 - \exp[-(\lambda x)^{\alpha}], x > 0.$$

It equals

$$M(1) = (1/\lambda)\Gamma(1 + 1/\alpha).$$

The expression for the median is

$$x^{(med)} = (\ln 2)^{(1/\alpha)}/\lambda,$$

we find

$$M\,(1)/x^{(med)} = \Gamma\,(1 + 1/\alpha)/(\ln 2)^{(1/\alpha)}.$$

Let us calculate

$$M\,(1)/x^{(med)} = A.$$

Let us solve the equation

$$\Gamma\,(1 + 1/\alpha)/(\ln 2)^{(1/\alpha)} = A$$

of the relatively known exponent α.

Here

$$\Gamma\,(1 + 1/\alpha) = \int\limits_{t>0} t^{(1/\alpha)} \exp(-t)\,dt$$

is the value of gamma function in the point $1 + 1/\alpha$.

Let us create the process of finding the expression

$$(\ln 2)^{(1/\alpha)} \int\limits_{t>0} t^{(1/\alpha)} \exp(-t) dt$$

with the previously assigned accuracy, the equation

$$\Gamma\,(1 + 1/\alpha)/(\ln 2)^{(1/\alpha)} = A$$

is solved using bisection or the method of golden section.

Let us use $\alpha = 1/3$ for the initial structure.

As an example.

If $x^{(med)} = 30, \alpha = 1/3$

$$x^{(left)}(100) = 30 * (2/\log 2)^3 = 30 * (6.64385618977472469574 \ldots)^3 = 8797.9588\ldots$$

$\Delta = x^{left}(1)$ is the left boundary of the first level, the value the crediting of remuneration starts from,

$A(1)$ length of the first level interval,

L — number of levels (in this case $L = 100$),

$D = x^{left}(L)$ — left boundary of the top level.

Let us determine:

$$S = [(D - \Delta)/A\,(1)]^{[1/(L-2)]}$$

the range extender of level intervals (starting from the second one).

For all levels, starting from level 2 ($2 \leq k \leq L$), the left interval boundary of level k equals:

$$x^{left}(k) = x^{left}(1) + A(1) * S^{(k-2)} = \Delta + A(1) * S^{(k-2)},\ 2 \leq k \leq L.$$

To illustrate this.

Let us calculate the length $\Delta(k)$ of the level interval k, $1 \leq k \leq L$.

If $k = 1$, the length of the first level interval equals $A(1)$:

$$\Delta(1) = x^{left}(2) - x^{left}(1) = [x^{left}(1) + A(1) * S^{(2-2)}] - x^{left}(1) = A(1).$$

If $k = 2$, the length of the second level interval equals:

$$\Delta(2) = x^{left}(3) - x^{left}(2) = A(1) * S^{(3-2)} - A(1) = A(1) * (S - 1).$$

If $k = 3$, the length of the third level interval equals:

$$\Delta(3) = x^{left}(4) - x^{left}(3) = A(1) * S^{(4-2)} - A(1) * S^{(3-2)} = A(1) * (S^2 - S).$$

If $k = 4$, the length of the fourth level interval equals:

$$\Delta(4) = x^{left}(5) - x^{left}(4) = A(1) * S^{(5-2)} - A(1) * S^{(4-2)} = A(1) * (S^3 - S^2).$$

If $k = L - 1$, the length of the $L - 1$st level interval equals:

$$\Delta(L-1) = x^{left}(L) - x^{left}(L-1) = A(1) * S^{(L-2)} - A(1) * S^{(L-3)} = A(1) * (S^{(L-2)} - S^{(L-3)}).$$

The left boundary of the L level interval equals:

$$x^{left}(L) = x^{left}(1) + A(1) * S^{(L-2)} = \Delta + A(1) * S^{(L-2)} = \Delta + A(1)[(D - \Delta)/A\,(1)] = D.$$

The relation of lengths of adjacent intervals:

$$\Delta\,(k+1)/\Delta\,(k),\ 2 \leq k \leq L-2,$$

starting from the second and ending with $L - 2$nd equals S:

$$\Delta\,(k+1)/\Delta\,(k) = [S^{(k)} - S^{(k-1)}]/[S^{(k-1)} - S^{(k-2)}] = S$$

for all $2 \leq k \leq L-2$.

7. We calculate level percentage coefficients $r(k)$ (level percentages $100 * r(k)$**)** for each level k,$k = 1, \dots, L$:

$$r(k) = 0.3 + 0.7 * [(k-1)/(L-1)]^{\beta},$$

$k = 1, \dots, L$, while the power parameter $\beta > 0$ determines the growth speed near small and big level values (downward or upward convexity of the level coefficients chart). If $\beta = 1$, the growth speed is constant (points on the chart are in a straight line).

8. Let us calculate the base power $W^b(n)$ of Assetbox n for each Assetbox number n using the formula:

$$W^b(n) = max[0.25 * B(n); W],$$

where

$$W = min[B(n); 0.25 * X]$$

is a minimum of the balance $B(n)$ of the Assetbox number n and the sum of minimums $min[B(n); B^1(n(i))]$ of its balance $B(n)$ and balances $B^1(n(i)) = B(n(i))$ of all the nodes of the first line of connection to Assetbox n multiplied by the coefficient 0.25:

$$X = \sum_{i=1}^{[l^{[1]}(n)]} min[B(n); B^1(n(i))].$$

In order to do that, let us perform the following sequence of actions:

1) Using the superscripts 1,…., we assign numbers to the levels (lines) of Assetboxes connected to the researched Assetbox assigned the superscript a.

2) We calculate the secondary variable:

$$X = \sum_{i=1}^{l} min[B^a(n); B^1(n(i))],$$

where l — number of Assetboxes in the first line of the Assetbox;

$B^1(n(i))$ — balance of the i Assetbox of the first line number $n(i)$.

3) We calculate the secondary variable:

$$W = min[B^a(n); 0.25 * X].$$

4) We determine the base power:

$$W^b(n) = max[0.25 * B^a(n); W].$$

Using this way of calculating base power, on condition that the first line of the researched Assetbox contains four Assetboxes with the balances equal to that of the researched one. This Assetbox will receive the maximum possible base power. There are other possible ways of structuring that would give the Assetbox the maximum possible base power for its balance.

9. Let us enter the normalized social power $W^{ns}(n)$ for each Assetbox number n, which is determined by the source contents of the node n, Assetboxes numbers $n(1), n(2), \ldots, n(l^{[1]})$ of the first line of connection $L^{[1]}(n)$ to the node n (they provide the base power for entering a level) and contents of the Assetboxes of all its connection branches below the first line connected to the Assetbox with the level percentage lower than that of the Assetbox number n (common value $\Pi(n)$).

$$W^{ns}(n) = \sum_{i=(l^{[1]}+1)}^{(Z(n))} [r(n) - C^*(n(i), n^{[1]}(\pi), n)] * B(n(i)) * I[r(n) > C^*(n(i), n^{[1]}(\pi), n)],$$

where $Z(n) = l^{[1]} + \Pi(n)$. Here, the variable $C^*(n(i), n^{[1]}(\pi), n)$ is determined as follows. There is a singular connection path from the node $n(i)$, located below the first line of connection to the Assetbox n, to the node n:

$$\pi(n^{[s]}(i), n)$$

that equals:

$$[n^{[s]}(i) \to n^{[s-1]}(\pi(n^{[s]}(i), n)) \to \ldots \to n^{[2]}(\pi(n^{[s]}(i), n)) \to n^{[1]}(\pi(n^{[s]}(i), n)) \to n^{[0]}(\pi(n^{[s]}(i), n))],$$

or simplified as:

$$[n^{[s]}(i) \to n^{[s-1]} \to \ldots \to n^{[2]} \to n^{[1]} \to n^{[0]}]$$

that starts at the node $n(i) = n^{[s]}(i)$ at the bottom level $[s]$ and ends at the node $n = n^{[0]}(\pi(n^{[s]}(i), n)) = n^{[0]}$ at the top one, at level 0 from its point of view.

While

$$C^*(n(i), n^{[1]}(\pi), n) = max[r(n^{[1]})r(n^{[2]}), r(n^{[3]}), \ldots, r(n^{[s-1]}), r(n^{[s]})]$$

is the maximum of all level percentage coefficients

$$r(n^{[1]}), r(n^{[2]}), r(n^{[3]}), \ldots, r(n^{[s-1]}), r(n^{[s]})$$

of the nodes

$$n^{[1]}, n^{[2]}, n^{[3]}, \ldots, n^{[s-1]}, n^{[s]}$$

on the path

$$\pi(n^{[s]}(i), n) = [n^{[s]} \to n^{[s-1]} \to \ldots \to n^{[2]} \to n^{[1]} \to n^{[0]}]$$

of connections from the node $n(i) = n^{[s]}(i) = n^{[s]}$ to the node $n = n^{[0]}(\pi(n^{[s]}(i), n)) = n^{[0]}$.

The sum total is calculated using all the branches below the first line of connection to Assetbox number n, the level percentage of which is lower than that of Assetbox number n. No branches of the Assetbox with the level percentage lower than that of Assetbox number n are used in calculations.

10. Let us calculate the majorized social power $W^{ms}(n)$ for Assetbox number n:

$$W^{ms}(n) = \sum_{i=(l^{[1]}+1)}^{(Z(n))} [r^{max} - C^*(n(i), n^{[1]}(\pi), n)] * B(n(i)) * I[r^{max} > C^*(n(i), n^{[1]}(\pi), n)].$$

The majorized social power of node n is different from the normalized social power due to the use of the variable $r^{max} = 1$ instead of the variable $r(n)$.

11. Then we calculate the social power $W^s(n)$ of the node n based on the normalized social power $W^{ns}(n)$ using the formula:

$$W^s(n) = W^{ns}(n) * g(C^o(n))$$

Here we introduce the social normalized function $g(x)$ to ensure the social direction of mining, which equals:

$$g(x) = [h + (1-h)(1 + px^\eta)q^{(1-x)}],$$

$$0 < h < 1, q > 1, p \geq 0, \eta \geq 0.$$

Here h — level of unachievable minimum of the social normalized function;

p — regulator of the wavelet of the social normalized function chart;

η — indicator of the power that ensures the wavelet of the function chart;

q — base of an exponential social normalized function, which ensures its movement towards an unachievable minimum h.

The argument x of the social normalized function is represented by the variable:

$$C^o(n) = W^{ms}(n)/B^{avg},$$

which equals the relation between the majorized social power $W^{ms}(n)$ and the average B^{avg} of the Assetbox balances.

12. Let us calculate the power $W(n)$ for each Assetbox number n as a sum of base and social powers of the node n:

$$W(n) = W^b(n) + W^s(n)$$

13. The received sum S is split among all Assetboxes

$$S = \sum_{n=1}^{N} S(n)$$

in direct proportion to their powers $W(n)$ using the formula for calculating remuneration $S(n)$ for the n-th Assetbox:

$$S(n) = S * W(n)/W,$$

where

$$W = \sum_{n=1}^{N} W(n)$$

is the sum of powers of all Assetboxes.

The values of parameters in the realized model:

1) $z = 1$

2) $\alpha = 1$

3) $c = 0.8$

4) $d = 1/3$

5) $r^{min} = 0.3, L = 100, \beta = 0.5$

6) $q = 2, p = 1.5, \eta = 1.46, \Delta = 10^{-3}, A(1) = 1, h = 0.05$

Article 38. Parameters of the Formulas for Calculating Remuneration for Mining

1. $\Delta = 10^{-3}$ — minimum Assetbox balance required to receive remuneration.
2. $I(1) = 1$ — length of the first level interval.
3. k = 1 — first line value coefficient.
4. $a = 1$ — power of the main summands in an endless asymptotic.
5. $c = 0.8$ — coefficient that regulates the value of the function in unity.
6. $d = 1/3$ — exponent that allows setting the value of entering the level of zero Assetboxes to zero.
7. $r^{min} = 0.3$ — minimum value of level percentage coefficients.
8. $L = 100$ — tables of rank percentages of Assetbox powers and correspondence of the Assetbox power and the first line to a certain rank are calculated in a dynamic manner based on the maximum power in the system. As the number of levels changes, the boundaries of level intervals also change.
9. $\beta = 0.5$ — power parameter that determines the level of growth near small and big level values; must be higher than 0.
10. $h = 0.05$ — level of an unachievable minimum (bottom boundary) of a social function; must be higher than 0, but lower than 1.
11. $p = 1.5$ — regulator of the wavelet of the normalized function.
12. $r = 1.46$ — power for the argument of the social function.
13. $q = 2$ — base of an exponential social normalized function q, which ensures its movement towards an unachievable minimum h.

SECTION 4. INFRASTRUCTURE BUILDING MINING OF THE BITBON SYSTEM

Chapter 10. System of Infrastructure Building Mining

Article 39. Concept of Infrastructure Building Mining of the Bitbon System

1. The main idea of Infrastructure building mining is to create a global, highly reliable and accessible distributed storage of protected data, which is supported by **Bit**bon System Users in the status of a **Bit**bon System Miner in order to create and develop the decentralized services of the **Bit**bon System.
2. A **Bit**bon System Miner that participates in Infrastructure building mining provides his/her computing and telecommunication resources of appropriate quality and with appropriate speed of the Internet channel, processor time and amount of memory for long storage of information in order to ensure the functioning of the decentralized execution environment of the **Bit**bon System.

Article 40. Stages of Launching Infrastructure Building Mining of the Bitbon System

1. The 1st stage of launching Infrastructure building mining is characterized by the use of the Community PoS algorithm in supporting the infrastructure of the **Bit**bon System.
2. During the 1st launch stage, Infrastructure building mining of the **Bit**bon System is carried out by a single **Bit**bon System Operator, SIMCORD LLC, independently, until the full implementation of Simcord’s blockchain with the ability to connect their own nodes by other **Bit**bon System Users.
3. Until the infrastructure of the **Bit**bon System can be supported entirely by its community, SIMCORD LLC shall independently conduct Infrastructure building mining using its own technical and intellectual resources to expand and support the node network of the blockchain of the **Bit**bon System.
4. During the 1st launch stage, SIMCORD LLC, as the sole participant in Infrastructure building mining will receive remuneration that equals the number of **Bit**bon accounting units distributed among all participants in Consensus building mining as remuneration for one mining period. SIMCORD LLC uses the received remuneration as a **Bit**bon System Participant to create and implement innovative solutions as well as support, update and develop the intellectual, software and hardware infrastructure of the **Bit**bon System.
5. The 2nd stage is characterized by transferring the infrastructure of the **Bit**bon System to the public blockchain of Simcord with the ability for **Bit**bon System Users to engage their own nodes in Infrastructure building mining.

6. During the 2nd stage of launching Infrastructure building mining, remuneration from the Mining Fund is distributed among all participants of this type of mining (including SIMCORD LLC) taking into account the quality of the resources used by each of them in accordance with Clause 61 of the **Bit**bon System Public Contract.

SECTION 5. CONCLUSION

Chapter 11. General and Other Conditions

Article 41. General Conditions

1. Amendments and additions to this Appendix can be made only in accordance with the rules specified in the Appendix “Making Amendments and/or Additions to the **Bit**bon System Public Contract”.
2. In case of any differences between various versions (written, printed, electronic, etc.) of this Appendix, the electronic version located on the official information resources of the **Bit**bon System shall prevail.
3. This Appendix has been translated into other languages for convenience only. In case of any differences in the interpretation of this Appendix, the Russian version shall prevail.
4. Only **Bit**bon System Operators have the right to interpret this Appendix. Any other interpretation is unacceptable.
5. In case of any differences in interpreting the terms of this Appendix, one should use their definition in the Appendix “Terms and Definitions in the **Bit**bon System”.

Article 42. Other Conditions

1. **Bit**bon System Operators aim to maintain an uninterrupted operation of the services and components of the **Bit**bon System. By participating in mining, a **Bit**bon System User accepts that there is possibility of failures in the operation of the services and/or components of the **Bit**bon System, which can lead to temporary limitation on any part of the rights and opportunities of a **Bit**bon System Miner.
2. Remuneration of a **Bit**bon System Miner that is not credited due to the failure in the operation of the services and/or components of the **Bit**bon System shall not be credited again and/or reimbursed.

3. A **Bit**bon System User shall not participate in mining if he/she does not accept the terms and conditions established by the **Bit**bon System Public Contract and this Appendix in part or in full.
4. The participation of a **Bit**bon System User in mining indicates the agreement to the terms and conditions established by the **Bit**bon System Public Contract and this Appendix.