

FACTOM GOVERNANCE

DOC 001

Document control matrix*			
ENTITY/ENTITIES	PART OF DOCUMENT	APPROVAL TYPE	APPROVAL AUTHORITY FOR THIS DOCUMENT
Standing Parties**	No highlight	Simple majority approval by each Standing Party Group	Yes
Not applicable	Not applicable	Single entity approval	No

* See [Doc 002 - Administration of governance- and community documents](#), Chapter 3.

** See [Doc 001 - Factom Governance](#), Definitions.

VERSION	DRAFT DATE	DRAFT BY	CHANGES	APPROVED BY	APPROVED DATE
1.0	N/A	Factom Community	Final document for ratification	Factom Community	2018-04-07
1.1	N/A	Factom Guides	Version 1.1	Factom Guides	2018-04-17
1.2	N/A	Factom Guides	Version 1.2	Factom Guides	2018-05-04
1.3	N/A	Factom Guides	Version 1.3	Factom Guides	2018-06-17
1.4	2019-02-21	Factom Guides	Required changes to make document compatible with other community documents (Doc 100, Doc 101, Doc 002). Deleted text about guide initial roles.	Standing Parties	2019-03-01
1.5	2019-04-22	Factom Guides	Assorted changes to section 2, 3 and 4.	Standing Parties	2019-05-06
1.6	2019-10-28	Factom Guides	Authority Set removal section 3.3, Support Categories section 6.2	Standing Parties	2019-11-13
2.0.0	2020-04-13	Governance Working Group	The references to guides have been completely removed.	Standing Parties	2020-05-08

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Definitions

Protocol

Unless explicitly modified to refer to other protocols, the term protocol in this document refers to the Factom protocol, which is implemented in software, and run upon servers run by many independent users and parties. The protocol's definition is substantially defined by the software run by the [authority set](#). The protocol creates an immutable record of data, and distributes it over the participating nodes on the network.

Governance

Governance is the process by which a distributed group of entities design, implement, deploy, execute and promote the protocol, and the ecosystem around the protocol. Much of governance centers on the protocol code that in turn generates and provides incentives in the form of tokens, and distributes those tokens by the rules embodied in the code. ~~The Guides aid in managing this process.~~

Community

Community in this document refers to the community of users, developers, investors, traders, and organizations that have an interest in building, running, promoting, and using the Factom protocol, and other protocols building upon or dependent upon the Factom protocol. Community is central to Factom as everyone with an interest in Factom has an opportunity to play a role in maintaining, developing, and promoting the Factom protocol.

Factom Community Testnet Network

The entirety of the Testnet Network including all operating nodes and the community of users who support the Testnet Network.

Testnet Authority Pool

The group of Qualified Authority Nodes, including nodes currently operating as part of the Authority Set of the Community Testnet.

Federated Server

A node that is authorized to create directory blocks and write to the blockchain. The Federated servers use a consensus algorithm to agree on what to include in the blocks.

Audit Server

The Audit Servers operate in the same manner as the Federated Servers; in practice, they do the same work, but are not authorized to write to the blockchain. If a federated server is removed from the federated server Set, an Audit server is promoted to take its place, and the Federated Server becomes an audit server.

Authority Set

The complete set of Federated Servers and Audit Servers. These are the servers that run and serve as the backbone of the protocol.

The Factom Mainnet will include 65 servers in the Authority Set after Milestone 3 (33 Federated servers and 32 Audit servers).

All Audit and Federated Servers share equally in the tokens issued by the protocol.

Authority Node Operator (ANO)

An entity or an individual selected via governance processes to operate and maintain Federated Server(s) and/or Audit Server(s).

Digital identity

Digital identity and digital identities in this document refer to a set of chains in the protocol used to define a digital identity. In some places, we simply refer to an identity, or a protocol identity. In this document, all of these terms refer to Digital Identity. Digital identities are central to governance, roles, voting, standing, and auditing in the protocol.

Grant Pool

The protocol will allow the authority set to signal a higher efficiency, by specifying a distribution less than the maximum distribution. Tokens left over due to the efficiency of the servers are placed into the grant pool within the protocol. The grant pool will be used to promote the protocol, subsidize infrastructure, and fund development of the protocol.

Efficiency

Efficiency in this document refers to how much we can reduce the cost of running the protocol. To the degree we can increase efficiency (reduce costs of running the protocol), we can increase the support of the grant pool. As such, the higher an Authority Node's deferment to the protocol, the higher its efficiency.

Standing Party

A party that has standing in the protocol to support a given outcome in any process. These processes include but are not limited to selection of guides, authority set members, and/or grant proposals.

Protocol Support Budget

The protocol support budget is a set of tokens generated at 72933.12 tokens per month. A month is defined as 4383 blocks, and a year is defined as 52596 blocks.

Proof of Stake (PoS)

Proof of Stake refers to using opportunity costs to secure a blockchain. Parties with tokens locked up are thought to be committed to the blockchain due to their exposure to the value of the blockchain, and thus can be trusted to make decisions within the blockchain. How stake is defined varies over blockchains.

Proof of Work (PoW)

The grandfather of blockchains, proof of work is usually done by hashing, where a nonce allows the miner to change the value of the hash by changing the nonce. Work is measured by non-random leading digits, usually zeros. More zeros, more work was done to find an appropriate hash.

Delegated Proof of Stake (DPoS)

Pretty much the same as PoS, but those with stake can delegate their voting power to other entities. This allows something of a more representative form of governance.

1. Introduction

- 1.1. The following documents the governance model for the Authority Set and the protocol.
- 1.2. The long term plan is to automate many of the objective components, the weighting driving decision making, and other aspects of protocol governance. As governance is fundamentally a human process, it is likely that not all aspects can be fully automated.
- 1.3. The Authority Set, Developers, and Community will work to develop and refine workable processes. Once agreed upon, these processes will be implemented into the protocol.

2. Authority Set

The Authority Set is comprised of entities (and hardware + software they control) to build blocks on the Factom blockchain. These entities are Authority Node Operators (“ANOs”) and are elected to the Authority Set in accordance with [Doc 005: ANO Election and Demotion System](#) and the principles set out in this chapter. Addresses specified by the individual ANOs are able to receive newly created FCT as reward for maintaining the hardware + software which advances progress of the blockchain.

Standing Parties will evaluate candidates based-on both technical and non-technical potential contributions to the Factom Protocol. Membership will be granted and revoked as a result of campaigns, and performance running the protocol with support of the Standing Parties.

2.1. Applications

- 2.1.1. Applicants wishing to be authorized to run an Authority Set node publish their desire to participate and document their qualifications by submitting an application via the Factom Protocol forum.

2.2. Campaign factors

- 2.2.1. The following are some factors that will be considered as indicators to begin with when deciding which entities running servers on the protocol to promote into the Authority Set.

2.2.2. Testnet participation

- 2.2.2.1. The applicant will demonstrate the ability to reliably run a node by having run an authority server as a member of the Testnet Authority Set.

2.2.3. Support of Protocol

- 2.2.3.1. Applicants commitment to the support of the Factom protocol will be a factor considered.
- 2.2.3.2. An application can pledge a level of [efficiency](#).

2.2.4. Node technical specifications and reliability

- 2.2.4.1. Authority Node Operators are expected to maintain their nodes at a level that is consistent with a healthy network. These include but are not limited to:
- 2.2.4.2. Plans for hot backup/brainswap servers.
- 2.2.4.3. Plans for the technical capabilities and capacity of proposed nodes.
- 2.2.4.4. Planned availability of the maintenance team.

2.2.5. Location

- 2.2.5.1. Having Authority nodes spread out over different geographies, jurisdictions, Autonomous System Numbers, and service providers will help keep the network running through localized failures.

2.2.6. Authority Server Specifications

- 2.2.6.1. The minimum server specifications are detailed in [Doc 202 - Authority Server Minimum Specifications](#), and applicants should ensure to meet these when submitting their application.

2.3. Authority Set Removal

2.3.1. Removal for cause:

- 2.3.1.1. ANOs not meeting the expectations set forth in [Doc 003: Authority Node Operator Expectations](#) may be removed from the Authority Set by the ANO Removal process defined in [Doc 101: Removal of ANO from the Authority Set for Cause](#).
- 2.3.1.2. Removed ANOs can campaign to re-enter the Authority Set once the issues are resolved. They will do this through means of ordinary ANO election campaigns.

2.3.2. Removal for loss of Standing:

- 2.3.2.1. ANOs must maintain a level of Standing as described in [Doc 005: ANO Election and Demotion System](#) to remain in the Authority Set. Should an ANO's Standing fall below the required threshold, the ANO will be removed

from the Authority Set for loss of Standing in accordance with the procedures set forth in Doc 005.

2.4. Authority Independence

Authorities are considered independent if they have no organizational or contractual ties to other individuals or organizations running authority nodes. Independence is also measured by sector. For example, the more nodes that are run by organizations in the financial sector, the less independent those nodes are, even if the organizations seem to qualify as being independent.

The factom protocol will strive to maintain a high degree of independence between authorities. Independence must be enforced socially through campaigns as it can't be measured on the blockchain.

3. Protocol Support Grants

A Grant Pool of tokens is maintained by the protocol to support upkeep, enhancement, and promotion of the protocol.

The pool is created from efficiency commitments made by Authority Node Operators. The details of the token rewards and the grant pool are discussed in the section on [Token Supply](#).

3.1. Grant Proposals

- 3.1.1. Proposals for grants may be made by anyone.
- 3.1.2. Grants are required to advance the protocol, through building infrastructure, promotion, development, or education. Grants may pay for completed work or support future work on the protocol.
- 3.1.3. Grants cannot be issued as part of a lottery, or any other game or chance, pyramid type reward structure, etc.
- 3.1.4. A grant proposal will specify what is to be accomplished with the tokens awarded, a time frame for accomplishing the aims of the grant, a general description of how the aims will be achieved, and a measurement by which success of the grant can be measured.

For complex efforts, grant awards will be issued on completion of milestones specified in the grant proposal. A sponsor or sponsors selected from the guides, or willing Standing Parties may be appointed to validate milestones. This administration should be part of the proposal itself, with the support of the parties that would have to oversee the grant.

3.2. Grant Approval

Grants will be awarded based on proposals that receive a score of 60 or more out of 100. The score comes from using the following weighted set of [support categories](#). To influence the rewarding of a grant, one must be a [standing party](#).

Support is divided into a number of categories, and weighted independently to limit opportunities for gaming.

3.3. Grant Award Process

- 3.3.1. Grants will be awarded on a regular cadence. The Standing Parties will define the cadence of the Grant process.
- 3.3.2. Grants are awarded and distributed in accordance with [Doc 107 - Factom Grant Process](#).

3.4. Ongoing Governance Grants

The protocol needs to support a number of activities to maintain the protocol in an ongoing fashion. These grants to maintain ongoing operations of the protocol take precedence over other grants which improve the protocol.

3.4.1. Anchor master

The anchor master project would fund the development, maintenance, and execution of the code to build and write anchors into Bitcoin, Ethereum, and other chains. At the same time, an independent anchor monitor should be funded to inspect and report on the performance of the anchor master.

Details of how to define and manage these roles can be refined over time. Issues to consider in more detail:

- Varied cost of anchoring
- Pricing of the roles
- Number of supported chains, and those costs
- Redundancy in the event of failures
- Number and responsibilities of anchor monitors

3.4.2. Oracle Master

Exchange rates for FCT to Entry Credits are important in order to maintain a target price for entry credits of 1/10 of a cent. As determined by the Standing Parties and the Authority Set, the Oracle Master will record into Factom relevant market information to establish the trading price of Factoids.

3.5. Token Supply

The Token supply will grow through a fixed set of awards that amounts to a 10% inflation of the Factoid supply in the first year, without considering usage of the protocol (which burns Factoids).

The protocol support budget is fixed at about 72933.12 tokens per month, where a month is defined as 4383 blocks. ($365.25 \times 24 \times 60 / 10 / 12$)

In many blockchains, Proof of Work accounts for much of the rewards issued for the security of the blockchain. In other words, most of the resources are expended on energy costs rather than development, maintenance, and infrastructure. As the protocol uses anchoring, resources can be expended on a sort of “Proof of Development,” extending and developing the protocol and the ecosystem around the protocol. This is the motivation around the Grant Pool design.

3.6. Token Rewards

- 3.6.1. The Protocol issues tokens for each server in the Authority Set. The issuance would be fixed at .256 Factoids per Authority Server per block. If one assumes a year to be 365.25 days, 10 minute blocks, and 65 servers in the authority set, then 72933.12 tokens will be created per month, and 874,598.4 tokens per year. This is roughly a 10 percent inflation rate for the first year of token distribution.

3.7. Grant Pool Allocation

- 3.7.1. While Authority Servers can specify all 0.256 Factoids be issued by the protocol, these servers compete to provide lower cost service to the protocol. As such, a server can specify a lower share, say 0.2 Factoids, or 0.13 Factoids per block.
- 3.7.2. Tokens not distributed to an authority server are allocated instead to the grant pool.

3.8. Authority Set Veto

- 3.8.1. The Coinbase transactions, and thus all issuance of new Factoids can be vetoed by a majority of the Authority Set. Due to protocol bugs or issuance of Factoids that would be detrimental to the protocol, the Authority Set can prevent a particular pending Factoid issuance.
- 3.8.2. Coinbase issuances are proposed 1000 blocks (normally ~7 days) before they become active in the Factoid block. The majority of the Authority Set can cancel any output in any coinbase between when it is proposed and when it is issued.
- 3.8.3. The majority of the Authority Set would create digital signatures to specify a coinbase output to cancel. If a majority of the Authorities at the time publish their signatures on the blockchain, the specified output will not appear in the Coinbase.



- 3.8.4. The balance of the canceled Coinbase is returned to the Grant Pool to allow an orderly rectification of the error at a future time.
- 3.8.5. Information about how to execute coinbase cancellations can be found in [Doc 203 - Cancellation of coinbase outputs](#).

4. Standing Parties

A Standing Party (one that has standing in the protocol to vote in a protocol process) must qualify in some way. The protocol has a number of mechanisms to define Standing Parties.

Factom uses [DPoS](#) to define the Standing Parties and how support is collected and measured. This is done by defining how the [PoS](#) is defined, then how it is distributed.

PoS is not as simple as it might first seem. When people can use tokens to stake to make decisions, the game theory is complex, with many unintended outcomes and incentives.

Factom intends to use a number of distinct categories that combine to define a voting weight for various issues within the protocol. The idea is to introduce tradeoffs that can be adjusted to ensure behaviors like bribery and influence pooling does not yield the optimal outcome for individuals.

Some categories like Efficiency and Entry Credit purchases seek to provide influence to parties actively engaged in using and running the protocol. The value of these activities is ranked high at the time of execution, and reduces over time. Other categories like staking tokens provide influence to those willing to commit resources to the protocol. As time goes on, staking gains influence as long as the tokens are not touched.

The interesting observation is that each of the categories that tend to either burn tokens (EC buys) or relinquish tokens (Efficiency) get their influence up front because once committed, the tokens are not available to the Standing Party. On the other hand, Staking provides the tokens to the Standing Party, so they are not lost. The value to the protocol is in keeping them staked, so their influence grows over time.

Tokens can not be used for multiple categories, by their nature. You can't leave tokens in the grant pool, and stake them. Or buy Entry Credits with them. And a bribe removes the tokens from your control, and can only gain influence if other parties are not engaged in such behavior.

4.1. Requirements for a Standing Party

- 4.1.1. A standing party has a digital identity.
- 4.1.2. The digital identity must have an entry that defines a voting signature. This voting signature can be changed by a properly signed entry with one of the digital Identity's signing keys.

4.1.3. The digital identity must be registered in the Standing Party Registration chain.

4.1.4. A Standing Party must have one or more categories of support.

4.2. Support Categories

Each Standing Party has a number of categories of support. For voting for different processes, these categories can be weighted differently. This is a matter to be determined.

The following sections detail each of the possible support categories.

4.2.1. Support category: Proof of stake

4.2.1.1. To collect support from proof of stake, tokens are assigned to the standing party chain via a properly formed entry that details the address holding the tokens, and is signed by that address.

4.2.1.2. Retrospective staking

4.2.1.2.1. Any change to the tokens at that address invalidates the proof of stake vote. An address can only be staked once. To be staked again, the tokens must be moved to a new address, which has not been staked to any standing party.

4.2.1.2.2. Tokens allocated to a proof of stake address assigned to a standing party will accrue additional voting weight equal to 5% of the original token count each month they are left in the proof of stake address until 24 months. After 24 months, no further weighting will accrue. (Note: Additional tokens will not accrue, just additional voting power.)

4.2.1.3. Prospective Staking

4.2.1.3.1. Tokens can be sent to an address which doesn't allow tokens to move from it for a predefined period of time.

4.2.1.3.2. Token locking functionality is not yet implemented in the protocol. The need and implementation schedule for token locking will be developed in Q2 of 2018.

4.2.2. Support category: Proof of use

- 4.2.2.1. To collect support from proof of use, entry credit purchases are assigned to the standing party chain via a properly formed entry that details the entry credit address, and properly signed with the entry credit address.
- 4.2.2.2. At the point of purchase, entry credits bought are weighted at 100%. With each month, the weight of an entry credit purchase is reduced by 20%, such that entry credits purchased more than six months back provides no support.

4.2.3. Support category: Authority set

- 4.2.3.1. An authority server is defined by a digital identity, and a properly formed authority identity has a voting signature. Being an authority server is a category of support.

4.2.4. Support category: Efficiency

- 4.2.4.1. Additionally, an authority server can specify an award of less than the maximum tokens issued to authority servers. Doing so is an indication of efficiency, and the unclaimed tokens are diverted to the [Grant Pool](#).
- 4.2.4.2. Calculating the value of support for efficiency uses a sliding scale with those levels of efficiency (the difference of the draw and the maximum token issue) in the last 30 days weighted at 100%. With each month, the weight of efficiency is reduced by 20%, such that efficiency greater than six months back provides no support.
- 4.2.4.3. Efficiency support is calculated on the number of tokens left to the grant pool. An authority server's ability to earn efficiency support is capped at 50%. An authority server can earn efficiency up to a maximum of 50% of the maximum tokens budgeted for an authority server.

4.2.5. Support category: Contribution

- 4.2.5.1. This is a theoretical idea, but for which we have no solution as of yet.

- 4.2.5.2. We may consider mechanisms for contributing to the grant pool without being an authority server. This is more complex from an accounting/legal perspective.
- 4.2.5.3. We may consider mechanisms for creating grant weight for direct support of protocol advancements, infrastructure development, conference sponsorship, protocol promotion, business development, security improvements, etc. This is hard because these activities are in the real world, not within the protocol.

4.3. Delegation

Delegation allows parties that don't have too much influence to lend their influence to parties that can spend more time thinking and researching issues regarding the protocol.

The disadvantage is the possibility of forming cartels and political parties. Bribery, regional conflicts, and other disruptions are encouraged when people can form stronger political movements in an organization than they can as individuals. We see this in governments today with entrenched political parties. Voting outside the parties is considered by most as a waste of time.

4.3.1. Delegation Process

An individual's standing is defined by their digital identity and entries on that digital identity that provide cryptographic proof of stake, Entry Credit purchases, Efficiency, etc.

Delegation is done by a Digital Identity signing and adding a delegation record entry in the receiving Digital Identity. This entry includes a numbered weight of each category. The support is withdrawn by adding a withdrawal entry added to the receiving Digital Identity.

4.3.2. Delegation Penalty

When standing is delegated, it loses some of its voting power as follows:

- 10% from an original Standing party to another.
- 20% from a second party to a third.
- 30% from a third to a fourth.



- 30% on any additional delegation.

The purpose is to make individual support more powerful than the same Standing Parties would be if they delegated their support.

5. Amendments and additional community documents

- 5.1. This Factom Governance Doc 001 is a living document that will need to be amended on a regular basis. Amending it shall only be executed in accordance with the process described in [Doc 002 - Administration of Governance- and community documents](#).
- 5.2. Additional Factom governance and community documents shall be created and administered in accordance with the procedures set forth in Doc 002.