

# LOGOS NETWORK GENESIS INITIALIZATION WHITEPAPER

The intention of this white paper is to provide a summary of Logos Network's genesis initialization sequence, which will be split up into two parts: network bringup and node discovery.

## NETWORK BRINGUP

### BACKGROUND

In delegated proof-of-stake (dPoS) systems, a group of delegates are selected by those in the system to be the validators and operators of the consensus algorithm. However, this presents a chicken and egg problem at the start up of these networks as there are neither voters to vote in these validators, nor validators to validate these votes. We will first take a look at how other dPoS platforms have addressed this initialization problem before going into Logos' implementation.

### EOS

EOS preselected the delegates in their system before their initialization process. Pre-launch, EOS selected a group of 50 of their most proficient members to create a Go-Live Pool. In order to minimize centralization, the Pool used a "provably random technique" to select 22 of their members to create a Go-Live Team. This team then published a list of their members and established secure mutual VPN connections between them to minimize the possibility of DDOS and other attacks. Once a snapshot of beginning account balances is taken (distribution through ERC-20 tokens), the Go-Live Team will wait until the snapshot has been verified by 15 of the 22 members and then once again use a "provably random technique" to select 1 of their members as the BIOS Boot node, who will be responsible for kicking off the entire network.

The BIOS Boot node builds the first new block, installs the core operating contracts, and installs the other 21 members of the Go-Live Team as the initial set of 21 delegates. These 21 initial delegates will then make themselves visible to the network. It is at this point that the rest of the Go-Live Pool can connect to the network and announce their candidacy for elections. Token holders would then connect and stake their tokens and cast votes in elections. These initial delegates will keep holding elections until all of them are replaced by elected delegates.

It will then transition into a constitution phase, and allows any stakeholder to propose a new constitution that requires the votes from at least 50% of the active accounts on stake and to hold that for 15 days or holds the lead for 30 days. The network then requires 15% or more of the total EOS token balance to connect to the network and perform a valid staking/voting transaction. Before this occurs, tokens transfers between accounts and block rewards are blocked.

## **Cosmos**

Cosmos similarly had a process of preselecting the validators on their network. They first determined the initial allocation of ATOMs based on their various fundraising rounds. Pre-launch, Cosmos then allowed for anyone with an initial allocation to apply to be a validator through submitting a genesis transaction request on their Github repository. At a predetermined time, both the genesis transaction requests as well as the initial allocations were put into a genesis file. Once a genesis file was agreed upon by their community, those that had genesis transactions in the final genesis file were selected to be the networks first validators. This final genesis file was then published and the first validators were expected to bring up their nodes with this genesis file at a pre-agreed upon time.

The network then waited for  $\frac{2}{3}$  of the voting power of this initial validator set to come online. This allowed the creation of the first block, which signaled a successful launch.

## **LOGOS NETWORK**

Logos Network's network bringup will consist of three phases: 1. Pre-launch, 2. Ignition, 3. Launch

### **Stage Pre-Launch:**

Similar to EOS, Logos Network will need to preselect a set of known nodes to be known as Genesis Delegates. Assuming the initial start up of the Logos Network will be through partnerships, these partners will be selected to run the 32 Genesis Delegates. Due to this difference in start up conditions of the Logos Network, there is no need for the process of randomly selecting between this initial group unless the potential number of Genesis Delegates surpasses the needed 32.

The 32 Genesis Delegates will generate private and public keys and provide their public keys to Logos. Because their initial starting balances are known, these Genesis Delegates will also be required to provide a pre-signed Stake request, self staking their balance. These Stake requests will be verified manually offline. In this way, the core software will not have to deal with a period where there is no staking. Logos will then generate a Genesis Config File which will include these pre-signed Stake requests as well as all necessary funding Send requests (and corresponding Receive blocks). This will be distributed to all Genesis Delegates and will serve as the official final initialization state of the network.

\*\*\*\*\* The distribution method of Logos needs to be discussed before this can be finalized  
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### **Stage Ignition:**

At a preset time, the Genesis Delegates will be launched with the Genesis Config File and will find and connect to others by querying the DNS nodes hardcoded in the software (detailed in later section). They would then construct their own p2p networks. Genesis Delegates will use

the other 31 Delegates' BLS keys to encrypt their own IP address and advertise it through the p2p network until all Genesis Delegates have found each other and connected. Each Genesis Delegate will then start processing the requests in the Genesis Config File which will not go through consensus and will directly be written to their respective databases.

These 32 Genesis Delegates will then remain in power for the first X epochs. Because they came into power with 0 votes, they will automatically be given a voting power of 1. During the first X epochs, non-Genesis Delegate nodes will have a chance to connect to the network and propose Stake, Proxy, AnnounceCandidacy, and StartRepresenting requests. They will similarly find other nodes by querying the DNS nodes.

At epoch X, the first election will occur and ElectionVote requests will be enabled. This initial election phase will occur for 4 epochs until every Genesis Delegate has participated in an election.

### **Stage Launch:**

At epoch X+5, the results of the first 4 elections will have propagated and a set of 32 elected delegates will be in power. At this time, all requests will be enabled and the network will have been considered launched.

## **NODE DISCOVERY**

In order to maintain simplicity throughout the core software design, the core software will not differentiate between node discovery during Network Bringup and node discovery at a later time.

When a node is brought up for the first time, it will not have the IP addresses of any active full nodes. In order to find IP addresses, it will query a set of DNS nodes that will be hardcoded in Logos Core software. The DNS node will respond with a list of IP addresses of known active full nodes. It will also add the node's IP address to its own database.

The DNS nodes will scan the network and maintain an updated list of active nodes. The DNS nodes' responses are not authenticated and therefore will only be used as a last resort to obtain peers.

As a failsafe for problems on the DNS nodes, command line options will be provided to allow nodes to obtain a list of peers from a specific node given an IP address.

## **PUBLIC TESTNET**

For the public testnet bringup, Logos Network will implement a simplified version of the mainnet bringup sequence.