Shelley era

The Shelley era marks a significant milestone in the Cardano blockchain, transitioning from a federated network controlled by IOHK, Emurgo, and the Cardano Foundation to a decentralized network run by the community. The Shelley protocol parameters have been described in CIP-09, configuration file (`shelley-genesis.json`) includes various parameters that govern the behavior of the network during the Shelley era.

Key parameters in `shelley-genesis.json`


```
  "activeSlotsCoeff": 0.05,
  "genDelegs": {
    "ad5463153dc3d24b9ff133e46136028bdc1edbb897f5a7cf1b37950c": {
      "delegate": "d9e5c76ad5ee778960804094a389f0b546b5c2b140a62f8ec43ea54d",
      "vrf": "64fa87e8b29a5b7bfbd6795677e3e878c505bc4a3649485d366b50abadec92d7"
    },
    ...
    }
  },
  "protocolParams": {
   {
    "protocolVersion": {
        "major": 2,
        "minor": 0
    },
    "nOpt": 150,
    "a0": 0.3,
    "minPoolCost": 340000000,
    "decentralisationParam": 1.0,
    "maxBlockBodySize": 65536,
    "maxBlockHeaderSize": 1100,
    "maxTxSize": 16384,
    "tau": 0.2,
    "rho": 3.0e-3,
    "poolDeposit": 500000000,
    "keyDeposit": 2000000,
    "minFeeB": 155381,
    "minFeeA": 44,
    "minUTxOValue": 1000000,
    "extraEntropy": {
        "tag": "NeutralNonce"
    },
    "eMax": 18
   }
  }
  "updateQuorum": 5,
  "networkId": "Mainnet",
  "initialFunds": {

"00813c32c92aad21770ff8001de0918f598df8c06775f77f8e8839d2a0074a515f7f32bf31a4f41c7417a8136e8152bfb42f06d7
1b389a6896": 900000000000,
    "609783be7d3c54f11377966dfabc9284cd6c32fca1cd42ef0a4f1cc45b": 900000000000
  },
  "maxLovelaceSupply": 45000000000000000e,
  "networkMagic": 764824073,
  "epochLength": 432000,
  "systemStart": "2017-09-23T21:44:51Z",
  "slotsPerKESPeriod": 129600,
  "slotLength": 1,
  "maxKESEvolutions": 62,
  "securityParam": 2160
  ...
}
```


Non-Updatable Parameters

Field	Initial Value	Description

activeSlotsCoeff	0.05	The fraction of the total number of slots that will, on average, be selected to include a block in the chain. Smaller numbers increase security, but reduce efficiency.
genDelegs	...	Details of the public keys that have been selected by each of the genesis keys to act as a delegate for signing protocol updates etc.
updateQuorum	5	How many of the genesis delegate keys must endorse an update proposal.
networkId	"Mainnet"	Is this a testnet or mainnet
initialFunds	{}	initial distribution of funds to addresses.
maxLovelaceSupply	45000000000000000	The limit on the maximum number of lovelace that can be in circulation.
networkMagic	764824073	A magic number used to distinguish different networks.
epochLength	432000	The number of slots in an epoch.
SystemStart	"2017-09-23T21:44:51Z"	When did the system originally start operation.
slotsPerKESPeriod	129600	After how many slots will a pool's operational key pair evolve (Key Evolving Signatures).
slotLength	1	The length of each slot (in seconds).
maxKESEvolutions	62	What is the maximum number of times a KES key pair can evolve before a new KES key pair must be generated from the master keys.
securityParam	2160	After how many blocks is the blockchain considered to be final, and thus can no longer be rolled back (i.e. what is the maximum allowable length of any chain fork).

Updatable Protocol Parameters

Field	Initial Value	Description
protocolVersion	protocolVersion": { "major": 2, "minor": 2 }	Protocol version. Minor versions indicate software updates (will generally be 0). Major version 1 = Byron, 2 = Shelley
nOpt	150	"Target number of pools" ("k"). Impacts saturation threshold, encouraging growth in number of stake pools.
a0	0.3	"Influence Factor". Governs how much impact the pledge has on rewards.
minPoolCost	340000000	Minimum Pool Cost per epoch (in lovelace). Enables pledge effect.
decentralisationParam	1.0	Level of decentralisation. Starts at 1. Block production is fully decentralised when this reaches 0.
maxBlockBodySize	65536	Maximum size of a block body. Limits blockchain storage size, and communication costs.
maxBlockHeaderSize	1100	Maximum size of the block header. Should be significantly less than the maximum block size.
maxTxSize	16384	Maximum size of a transaction. Several transactions may be included in a block. Must be strictly less than the max. block body size.
tau	0.2	Treasury rate (0.2 = 20%). Proportion of total rewards allocated to treasury each epoch before remaining rewards are distributed to pools.

rho	3.0e-3	Monetary expansion rate per epoch. Governs the rewards that are returned from reserves to the ecosystem (treasury, stake pools and delegators).
poolDeposit	500000000	Pool deposit (in lovelace)
keyDeposit	2000000	Deposit charged for stake keys (in Lovelace). Ensures that unused keys are returned, so freeing resources.
minFeeB	155381	Base transaction fee (in lovelace).
minFeeA	44	Additional transaction fee per byte of data (in lovelace).
minUTxOValue	1000000	Minimum allowed value in a UTxO. Security-related parameter used to prevent the creation of many small UTxOs that could use excessive resource to process.
extraEntropy	{ "tag": "NeutralNonce" }	Should additional entropy be included in the initial phases. This provides additional certainty that the blockchain has not been compromised by the seed key holders. Redundant once the system is sufficiently decentralised.
eMax	18	Maximum number of epochs within which a pool can be announced to retire, starting from the next epoch.