

Lido V2 mainnet parameters

Tests setup configuration

Tests setup based upon parameters specified in [this config file](#) . This document can be used to validate the values.

Mainnet addresses

Some of the proposed addresses are listed in this section, but for the full list see [this document](#) .

LIDO_LOCATOR

0xC1d0b3DE6792Bf6b4b37EccdcC24e45978Cfd2Eb LEGACY_ORACLE =

0x442af784A788A5bd6F42A01Ebe9F287a871243fb

was LidoOracle before

See <https://docs.lido.fi/deployed-contracts/>

Old implementation was Withdrawals Manager Stub

Represents an address on Execution Layer corresponding to the Lido 0x01-type withdrawal credentials (see below)

WITHDRAWAL_VAULT

0xB9D7934878B5FB9610B3fE8A5e441e8fad7E293f

Same as withdrawalsVault with 0x01 type prefix

also see

<https://etherscan.io/address/0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84#readProxyContract>

WITHDRAWAL_CREDENTIALS

0x0100000000000000000000000000000000b9d7934878b5fb9610b3fe8a5e441e8fad7e293f

Lido

Good-old value, see

<https://etherscan.io/address/0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84#readProxyContract>

used in calculation of SIMULATED_SHARE_RATE_DEVIATION_BP_LIMIT

LIDO_MAX_STAKE_LIMIT_ETH

150_000

NodeOperatorsRegistry

Single staking module named "Curated" added to StakingRouter. For the details see [IP-20: Staking Router forum post](#)

See <https://snapshot.org/#/lido.snapshot.eth/proposal/0xa4eb1220a15d46a1825d5a0f44de1b34644d4aa6bb95f910b86b29bb76>

for "Their status shall revert to "In good standing" after 5 days (i.e. provided any newly received validator exit requests are processed timely"

CURATED_STAKING_MODULE_STUCK_PENALTY_DELAY

432000

5 days as seconds

Share of this staking module among all staking modules (in basis points, 100% = 10000). This is a single module so all 100% goes to it

<https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/StakingRouter.sol#L167-L175>

Currently have single Staking Module, so 100%

CURATED_STAKING_MODULE_TARGET_SHARE_BP

10000

100%

Shares of the rewards which goes to the curated set staking module and to the treasury (in basis points, 100% = 10000)

see <https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/StakingRouter.sol#L167-L175>

same as it set currently, see

<https://etherscan.io/address/0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84#readProxyContract>

<https://etherscan.io/address/0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84#readProxyContract>

NB: that getFeeDistribution returns percent relative to the 10% returned by getFee

for for curated staking module the value is set as percent relative to the entire rewards, so it 500 but 5000

CURATED_STAKING_MODULE_MODULE_FEE_BP

500

5%

CURATED_STAKING_MODULE_TREASURY_FEE_BP

500

5%

Just a technically and semantically reasonable values of the first module introduced

CURATED_STAKING_MODULE_ID

1 CURATED_STAKING_MODULE_NAME =

"curated-onchain-v1" CURATED_STAKING_MODULE_TYPE =

0x637572617465642d666e636861696e2d7631000000000000000000000000000000000000

bytes32("curated-onchain-v1")

OracleDaemonConfig

Parameters related to "bunker mode"

See <https://research.lido.fi/t/withdrawals-for-lido-on-ethereum-bunker-mode-design-and-implementation/3890/4>

and <https://snapshot.org/#/lido-snapshot.eth/proposal/0xa4eb1220a15d46a1825d5a0f44de1b34644d4aa6bb95f910b86b29bb76>

NB: BASE_REWARD_FACTOR: <https://ethereum.github.io/consensus-specs/specs/phase0/beacon-chain/#rewards-and-penalties>

NORMALIZED_CL_REWARD_PER_EPOCH

64 NORMALIZED_CL_REWARD_MISTAKE_RATE_BP = 1000

10%

REBASE_CHECK_NEAREST_EPOCH_DISTANCE

1 REBASE_CHECK_DISTANT_EPOCH_DISTANCE = 23

10% of AO 225 epochs frame

VALIDATOR_DELAYED_TIMEOUT_IN_SLOTS

7200

1 day

See <https://snapshot.org/#/lido-snapshot.eth/proposal/0xa4eb1220a15d46a1825d5a0f44de1b34644d4aa6bb95f910b86b29bb76>

snapshot.eth/proposal/0xa4eb1220a15d46a1825d5a0f44de1b34644d4aa6bb95f910b86b29bb76 for "Requirement not be considered Delinquent"

VALIDATOR_DELINQUENT_TIMEOUT_IN_SLOTS

28800

4 days

See "B.3.I" of <https://snapshot.org/#/lido-snapshot.eth/proposal/0xa4eb1220a15d46a1825d5a0f44de1b34644d4aa6bb95f910b86b29bb76>

NODE_OPERATOR_NETWORK_PENETRATION_THRESHOLD_BP

100

1% network penetration for a single NO

Time period of historical observations used for prediction of the rewards amount

see <https://research.lido.fi/t/withdrawals-for-lido-on-ethereum-bunker-mode-design-and-implementation/3890/4>

PREDICTION_DURATION_IN_SLOTS

50400

7 days

Max period of delay for requests finalization in case of bunker due to negative rebase

twice min governance response time - 3 days voting duration

FINALIZATION_MAX_NEGATIVE_REBASE_EPOCH_SHIFT

1350

6 days

OracleReportSanityChecker

Sanity limit on the number of deposits: not more than ~half of the current DSM deposits capacity (43200 it is)

https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/sanity_checks/OracleReportSanityChecker.sol#L221-L232

CHURN_VALIDATORS_PER_DAY_LIMIT

20000

Taken from current oracle limit

<https://etherscan.io/address/0x442af784A788A5bd6F42A01Ebe9F287a871243fb#readProxyCor>

See https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/sanity_checks/OracleReportSanityChecker.sol#L47-L50

ONE_OFF_CL_BALANCE_DECREASE_BP_LIMIT

500

5%

See <https://research.lido.fi/t/increasing-max-apr-sanity-check-for-oracle-lido-report/3205>

Related to Consensus Layer rewards only

ANNUAL_BALANCE_INCREASE_BP_LIMIT

1000

10%

According to https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/sanity_checks/OracleReportSanityChecker.sol#L647-L672

and assuming Staking rate limit = 150 000, TVL = 3 000 000

$SRL = 0.1$

$L = (2 * SRL) * \max(ONE_OFF_CL_BALANCE_DECREASE_BP_LIMIT, MAX_POSITIVE_TOKEN_REBASE)$

$L = 50$

SIMULATED_SHARE_RATE_DEVIATION_BP_LIMIT

50

0.5%

Same as the current churn limit in Ethereum (8 validators per epoch)

used in ValidatorsExitBusOracle, which has reporting period 8 hours

Formula for validator churn limit is https://github.com/ethereum/consensus-specs/blob/master/specs/phase0/beacon-chain.md#get_validator_churn_limit

currently we have ~562000 active validators, which gives 8 validators per epoch unless active validators grew up to 589824

MAX_VALIDATOR_EXIT_REQUESTS_PER_REPORT

600

See https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/sanity_checks/OracleReportSanityChecker.sol#L65-L67

Depends on the amount of staking modules and amount of data types. Have only one staking module at launch

and two data types exited and stuck validators (see <https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/oracle/AccountingOracle.sol##L282-L319>)

So need to deliver exited/delinquent sets of data: $1 \times 2 = 2$

MAX_ACCOUNTING_EXTRA_DATA_LIST_ITEMS_COUNT

2

See https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/sanity_checks/OracleReportSanityChecker.sol#L69-L71

and <https://github.com/lidofinance/lido-dao/blob/e45c4d6fb8120fd29426b8d969c19d8a798ca974/contracts/0.8.9/oracle/AccountingOracle.sol#L306>

could have been 200, since NOR allows up to 200 node operators

decided to halve it down since Lido has 29 node operators onboarded while have the margin for more node operators

MAX_NODE_OPERATORS_PER_EXTRA_DATA_ITEM_COUNT

100

See https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/sanity_checks/OracleReportSanityChecker.sol#L73-L75

and <https://research.lido.fi/t/withdrawals-for-lido-on-ethereum-bunker-mode-design-and-implementation/3890/4>

REQUEST_TIMESTAMP_MARGIN

7680

2 hours rounded to epoch length

27% yearly, in 1e9 so that it multiplied on 365 (link to code)

see <https://research.lido.fi/t/increasing-max-apr-sanity-check-for-oracle-lido-report/3205>

and https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/sanity_checks/OracleReportSanityChecker.sol#L77-L79

the value might be re-considered once the stETH liquidity sources landscape changed

MAX_POSITIVE_TOKEN_REBASE

750000

Burner

See <https://vote.lido.fi/vote/106>

and <https://etherscan.io/address/0xB280E33812c0B09353180e92e27b8AD399B07f26#readContract>

TOTAL_NON_COVER_SHARES_BURNT

32145684728326685744 TOTAL_COVER_SHARES_BURNT =

0

See <https://docs.lido.fi/deployed-contracts/>

AGENT

0x3e40D73EB977Dc6a537aF587D48316feE66E9C8c

_admin and _treasury

LIDO

0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84

_stETH

DepositSecurityModule

Same as at present

<https://etherscan.io/address/0x710B3303fB508a84F10793c1106e32bE873C24cd#readContract>

DSM_MAX_DEPOSITS_PER_BLOCK

150

Same as at present

<https://etherscan.io/address/0x710B3303fB508a84F10793c1106e32bE873C24cd#readContract>

DSM_MIN_DEPOSIT_BLOCK_DISTANCE

25

Same as at present

<https://etherscan.io/address/0x710B3303fB508a84F10793c1106e32bE873C24cd#readContract>

DSM_PAUSE_INTENT_VALIDITY_PERIOD_BLOCKS

6646

AccountingOracle

And its correspondingHashConsensus .

Once per day

Same as for current Oracle see

<https://etherscan.io/address/0x442af784A788A5bd6F42A01Ebe9F287a871243fb#readProxyContract>
AO_EPOCHS_PER_FRAME

225

So, the AccountingOracle expected report time would be ~12:00 UTC

Number of slots dedicated for delay during oracles rotation including finalization time

<https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/oracle/HashConsensus.sol#L370-L398>

NB: min value is 64 as two epochs are required for the chain finality

AO_FAST_LANE_LENGTH_SLOTS

100

Technical value indicating consensus version of the contract. Can basically be any because there were no consensus versions before <https://github.com/lidofinance/lido-dao/blob/e35435ad9b9473cb0f9b7b0e1e17f6bf9b96e000/contracts/0.8.9/oracle/BaseOracle.sol#L126>

AO_CONSENSUS_VERSION

1

See <https://docs.lido.fi/deployed-contracts/>

LIDO_LOCATOR

0xC1d0b3DE6792Bf6b4b37EccdcC24e45978Cfd2Eb LIDO =
0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84 LEGACY_ORACLE =
0x442af784A788A5bd6F42A01Ebe9F287a871243fb

ValidatorsExitBusOracle

And its correspondingHashConsensus .

Thrice per day

So, the ValidatorsExitBusOracle expected report time would be

~4:00 UTC, ~12:00 UTC, ~20:00 UTC

VEBO_EPOCHS_PER_FRAME

75

Number of slots dedicated for delay during oracles rotation including finalization time

<https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/oracle/HashConsensus.sol#L370-L398>

NB: min value is 64 as two epochs are required for finalization

VEBO_FAST_LANE_LENGTH_SLOTS

100

Technical value indicating consensus version of the contract. Can basically be any because there were no consensus versions before <https://github.com/lidofinance/lido-dao/blob/e35435ad9b9473cb0f9b7b0e1e17f6bf9b96e000/contracts/0.8.9/oracle/BaseOracle.sol#L126>

VEBO_CONSENSUS_VERSION

1

LIDO_LOCATOR

0xC1d0b3DE6792Bf6b4b37EccdcC24e45978Cfd2Eb

AccountingOracle and ValidatorsExitBusOracle

See <https://ethereum.org/en/developers/docs/blocks/>

CHAIN_SECONDS_PER_SLOT

12

See <https://blog.ethereum.org/2020/11/27/eth2-quick-update-no-21>

Also its as it is in the current oracle

<https://etherscan.io/address/0x442af784A788A5bd6F42A01Ebe9F287a871243fb#readProxyCor>

CHAIN_GENESIS_TIME

1606824023

WithdrawalQueueERC721

WSTETH_TOKEN

0x7f39C581F595B53c5cb19bD0b3f8dA6c935E2Ca0

_wstETH

WQ_ERC721_TOKEN_NAME

"Lido: stETH Withdrawal NFT" WQ_ERC721_TOKEN_SYMBOL =

"unstETH"

Lido-maintained NFT-generator server

see <https://github.com/lidofinance/lido-dao/blob/feature/shapella-upgrade/contracts/0.8.9/WithdrawalQueueERC721.sol#L126-L129>

WQ_ERC721_TOKEN_BASE_URI

"https://wq-api.lido.fi/v1/nft"

WithdrawalsVault

See <https://docs.lido.fi/deployed-contracts/>

LIDO

0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84

lido

AGENT

0x3e40D73EB977Dc6a537aF587D48316feE66E9C8c

_treasury

EIP712StETH

See <https://docs.lido.fi/deployed-contracts/>

LIDO

0xae7ab96520DE3A18E5e111B5EaAb095312D7fE84

_stETH

StakingRouter

See <https://ethereum.org/en/staking/deposit-contract/>

CHAIN_DEPOSIT_CONTRACT

0x00000000219ab540356cBB839Cbe05303d7705Fa

GateSeal

2 x governance response time - vote duration is 3 days

GATE_SEAL_PAUSE_DURATION

518400

6 days as seconds

GATE_SEAL_EXPIRY_TIMESTAMP

1714521600

2024-05-01 00:00 UTC

Roles setup

For the roles setup in tests see [the permissions test](#) .

Contracts ACL denotation:

- mark "Aragon app
- " means the contract is Aragon app which uses [Aragon ACL model](#)
- mark "OZ
- " means the contract uses [OpenZeppelin ACL model](#)
- mark "Proxy
- " means the contract is deployed behind a proxy so has an additional [ACL model related to the proxy](#)
- mark "Plain owner
- " means has custom simple ACL model with single owner and setter for it
- mark "No access control
- " means there is no any ACL

Lido

Aragon app

New

- UNSAFE_CHANGE_DEPOSITED_VALIDATORS_ROLE
- - None

Kept

- PAUSE_ROLE
- - Voting
- RESUME_ROLE
- - Voting
- STAKING_PAUSE_ROLE
- - Voting
- STAKING_CONTROL_ROLE
- - Voting

Obsolete To be revoked at voting.

- MANAGE_FEE
- - revoke from Voting
- MANAGE_WITHDRAWAL_KEY
- - revoke from Voting
- MANAGE_PROTOCOL_CONTRACTS_ROLE
- - revoke from Voting
- SET_EL_REWARDS_VAULT_ROLE
- - revoke from Voting
- SET_EL_REWARDS_WITHDRAWAL_LIMIT_ROLE
- - revoke from Voting
- DEPOSIT_ROLE
- - revoke from [SelfOwnedStETHBurner](#)
- - (obsolete contract)
- BURN_ROLE
- - revoke from [old DepositSecurityModule](#)
- - (obsolete contract)

NodeOperatorsRegistry

Aragon app

New

- STAKING_ROUTER_ROLE
- - StakingRouter (set in voting script) To be granted at voting.
- MANAGE_NODE_OPERATOR_ROLE
- - None

Kept

- MANAGE_SIGNING_KEYS
- - Voting
- SET_NODE_OPERATOR_LIMIT_ROLE
- - Voting

- - Easytrack EVMScriptExecutor

Obsolete To be revoked at voting.

- ADD_NODE_OPERATOR_ROLE
- SET_NODE_OPERATOR_ACTIVE_ROLE
- SET_NODE_OPERATOR_NAME_ROLE
- SET_NODE_OPERATOR_ADDRESS_ROLE
- REPORT_STOPPED_VALIDATORS_ROLE

LegacyOracle (former LidoOracle)

Aragon app

New None

Kept None

Obsolete To be revoked at voting.

- MANAGE_MEMBERS
- MANAGE_QUORUM
- SET_BEACON_SPEC
- SET_REPORT_BOUNDARIES
- SET_BEACON_REPORT_RECEIVER

AccountingOracle

OZ, Proxy

- PROXY ADMIN *Before vote start*: Template
- - After enactment:* Agent
- DEFAULT_ADMIN_ROLE
- - Before vote start:* None
- - After enactment:* Agent
- SUBMIT_DATA_ROLE
- - None
- MANAGE_CONSENSUS_CONTRACT_ROLE
- - None
- MANAGE_CONSENSUS_VERSION_ROLE
- - None

Burner

OZ, No Proxy

- DEFAULT_ADMIN_ROLE
- - Before vote start:* Template
- - After enactment:* Agent
- REQUEST_BURN_SHARES_ROLE
- - Before vote start:* Lido (set in Burner constructor)
- - After enactment:* Lido (set in Burner constructor)
- - - NodeOperatorsRegistry
- REQUEST_BURN_MY_STETH_ROLE
- - None

LidoLocator

OZ, Proxy

- PROXY ADMIN *Before vote start*: Template
- - After enactment:* Agent

StakingRouter

OZ, Proxy

- PROXY ADMIN *Before vote start*: Template
- - After enactment:* Agent
- DEFAULT_ADMIN_ROLE
- - Before vote start:* None
- - After enactment:* Agent
- MANAGE_WITHDRAWAL_CREDENTIALS_ROLE
- - None
- STAKING_MODULE_PAUSE_ROLE
- - DepositSecurityModule
- STAKING_MODULE_RESUME_ROLE
- - DepositSecurityModule
- STAKING_MODULE_MANAGE_ROLE
-

- None
- REPORT_EXITED_VALIDATORS_ROLE
- - AccountingOracle
- UNSAFE_SET_EXITED_VALIDATORS_ROLE
- - None
- REPORT_REWARDS_MINTED_ROLE
- - Lido

HashConsensus for AccountingOracle

OZ, No Proxy

- DEFAULT_ADMIN_ROLE
- - Before vote start:* Template
- - After enactment:* Agent
- MANAGE_MEMBERS_AND_QUORUM_ROLE
- - None
- DISABLE_CONSENSUS_ROLE
- - None
- MANAGE_FRAME_CONFIG_ROLE
- - None
- MANAGE_FAST_LANE_CONFIG_ROLE
- - None
- MANAGE_REPORT_PROCESSOR_ROLE
- - None
- address[] _memberAddresses
- - Before vote start:* None
 - After enactment:* Current LidoOracle Committee
- - - See[0x442af784A788A5bd6F42A01Ebe9F287a871243fb#readProxyContract#F28](#)

DepositSecurityModule

Plain Owner, No Proxy

- owner *Before vote start*: Template
- - After enactment:* Agent
- guardians *Before vote start*: None
- - After enactment:* Current DSM guardians committee
- - - See[0x710B3303fB508a84F10793c1106e32bE873C24cd#readContract#F8](#)

HashConsensus for ValidatorsExitBusOracle

OZ, No Proxy

- DEFAULT_ADMIN_ROLE
- - Before vote start:* Template
- - After enactment:* Agent
- MANAGE_MEMBERS_AND_QUORUM_ROLE
- - None
- DISABLE_CONSENSUS_ROLE
- - None
- MANAGE_FRAME_CONFIG_ROLE
- - None
- MANAGE_FAST_LANE_CONFIG_ROLE
- - None
- MANAGE_REPORT_PROCESSOR_ROLE
- - None
- address[] _memberAddresses
- - Before vote start:* None
 - After enactment:* Current LidoOracle Committee
- - - See[0x442af784A788A5bd6F42A01Ebe9F287a871243fb#readProxyContract#F28](#)

OracleDaemonConfig

OZ, No Proxy

- DEFAULT_ADMIN_ROLE
- - Agent
- CONFIG_MANAGER_ROLE
- - None

OracleReportSanityChecker

OZ, No Proxy

- DEFAULT_ADMIN_ROLE
- (set in constructor)* Agent
- ALL_LIMITS_MANAGER_ROLE
- CHURN_VALIDATORS_PER_DAY_LIMIT_MANAGER_ROLE
- ONE_OFF_CL_BALANCE_DECREASE_LIMIT_MANAGER_ROLE
- ANNUAL_BALANCE_INCREASE_LIMIT_MANAGER_ROLE
- SHARE_RATE_DEVIATION_LIMIT_MANAGER_ROLE
- MAX_VALIDATOR_EXIT_REQUESTS_PER_REPORT_ROLE
- MAX_ACCOUNTING_EXTRA_DATA_LIST_ITEMS_COUNT_ROLE
- MAX_NODE_OPERATORS_PER_EXTRA_DATA_ITEM_COUNT_ROLE
- REQUEST_TIMESTAMP_MARGIN_MANAGER_ROLE
- MAX_POSITIVE_TOKEN_REBASE_MANAGER_ROLE
- - None for all roles listed above

ValidatorsExitBusOracle

OZ, Proxy

- PROXY ADMIN *Before vote start*: Template
- - After enactment:* Agent
- DEFAULT_ADMIN_ROLE
- - Before vote start:* None
- - After enactment:* Agent
- PAUSE_ROLE
- - Before vote start:* None
- - After enactment:* Gate Seal
- RESUME_ROLE
- - None
- SUBMIT_DATA_ROLE
- - None
- MANAGE_CONSENSUS_CONTRACT_ROLE
- - None
- MANAGE_CONSENSUS_VERSION_ROLE
- - None

WithdrawalQueueERC721

OZ, Proxy

- PROXY ADMIN *Before vote start*: Template
- - After enactment:* Agent
- DEFAULT_ADMIN_ROLE
- - Before vote start:* None
- - After enactment:* Agent
- PAUSE_ROLE
- - Before vote start:* None
- - After enactment:* Gate Seal
- RESUME_ROLE
- - None
- FINALIZE_ROLE
- - Before vote start:* None
- - After enactment:* Lido
- ORACLE_ROLE
- - Before vote start:* None
- - After enactment* AccountingOracle
- MANAGE_TOKEN_URI_ROLE
- - None

WithdrawalVault

No access control, Proxy

- PROXY ADMIN* Voting [Edit this page](#) [Previous](#) [How to Bridge Tokens through Jumpgate](#) [Next](#) [API](#)