During the "soft-rollout" of MEV-Boost across Lido Node Operators as voted upon by the DAO in [v1.0 of the Lido on Ethereum Block Proposer Rewards Policy](#), Node Operators have tested multiple relays in the six weeks following the merge.

Node Operators have been asked to produce blocks via MEV-Boost infrastructure by obtaining sealed blocks from the maximum possible number of relays from the providers that expressed interest during Lido's initial [call for relay providers](#).

With the end of the "soft-rollout" period now approaching and initial tests of relays undertaken ([nearly all Lido related block proposals](#) are now being delivered through MEV-Boost infrastructure), we believe the timing is appropriate to vote upon the relays that will be included in the respective "must-include" and "allow-list" of relays to be populated on-chain as described in [LIP-17](#). As a reminder:

- The "must-include list" of relays will be DAO-vetted relays that are considered trustworthy, well-operated, and reliable.

- The "allow list" of relays will be DAO-approved, but perhaps less well-known or battle-tested relays which can be trialled prior to inclusion in the "must-include list".

Per the Block Proposer policy, Node Operators will be required to use as many of the "must-include list" relays as possible, allowing for flexibility as determined by each Node Operator's internal risk management and legal requirements.

As additional monitoring capabilities are developed over time, analysis will be undertaken and presented to the DAO to determine whether Lido Node Operators are finding an appropriate equilibrium between network and protocol health, staker rewards, and Operator specific compliance requirements.

Relay performance, consisting of factors such as timely unblinding of blocks, block inclusion time, accurate bid delivery, etc., is another important element that will need to be considered when information is fully available from the relevant API endpoints. For further information regarding the impact of MEV relays on the network see [Attestant's recent analysis](#). More detail regarding Lido's planned implementation for monitoring is available in the [Monitoring & Penalties Specification](#) of the Block Proposer Rewards policy.

Relay Provider Background:

During Lido's call for relay providers, five entities publicly expressed interest for Lido Node Operators to use their relays to propose blocks: Flashbots, bloXroute, Blocknative, Manifold Finance, and Eden.

As of 26/10/22, over the past seven days 63% of Lido block proposals have come through the Flashbots relay, 12% from bloXroute (including 6% from the ethical relay, 5% from the max profit relay, and 1% from the regulated relay), 6% from Eden, 3% from Blocknative, and <1% from Manifold**.

As discussed in the Block Proposer policy, relays suggested for inclusion in these lists should be:

1. publicly available,

2. publicly listed & maintained,

3. open source,

4. transparent about what (if any) transaction or address filtering they enforce.

In the call for relays thread, each provider had the opportunity to disclose their compliance with these suggested attributes. As a summary:

Flashbots:

1. publicly available - Yes

2. publicly listed & maintained - Yes

3. open source - Yes

4. transparent about what (if any) transaction or address filtering they enforce - Yes

:

Flashbots filters transactions that interact with OFAC sanctioned addresses.

bloXroute

:

1. publicly available - Yes

2. publicly listed & maintained - Yes

3. open source – No:

Planning to open source in 1-2 months (note: per the team this is still on track).

   1. transparent about what (if any) transaction or address filtering they enforce - Yes

:

a. Max profit: Relay that provide blocks with all available transactions/bundles with no filtering.

b. Ethical: Relay that provide blocks that have no frontrunning bundles. bloXroute tries its best to filter out MEV bundles that execute strategies like generalized frontrunning and sandwiching.

c. Regulated: Relay that provide blocks with all available transactions/bundles except the ones sent from/to wallet addresses that are sanctioned by OFAC.

Blocknative

:

   1. publicly available - Yes

   2. publicly listed & maintained - Yes

   3. open source - Yes

   4. transparent about what (if any) transaction or address filtering they enforce. - Yes

:

Blocknative's initial relay service will serve blocks that meet the OFAC compliance requirements of our early customers. We are monitoring the ecosystem in real time and will adjust to less filtering as soon as it makes sense.

Manifold

:

   1. publicly available - Yes

   2. publicly listed & maintained - Yes

   3. open source - No

   4. transparent about what (if any) transaction or address filtering they enforce. - Yes

:

Manifold does not filter OFAC sanctioned addresses (more detail:Here)

Eden

:

   1. publicly available - Yes

   2. publicly listed & maintained - Yes

   3. open source - Yes

   4. transparent about what (if any) transaction or address filtering they enforce. - Yes

:

a. Eden Relay provides blocks with transactions/bundles prepared by our own Eden Block Builder that is set up to always ensure regulatory compliance and respect all applicable regulations, including the OFAC sanction list (meaning no wallet addresses allowed through if they have been registered on the OFAC list).

b. All third party builders supplying transactions/bundles will need to accept ToS that disallow them to share transactions/bundles that have been sanctioned by OFAC (This will be enforced and penalized by removal/blacklisting of block builder if detected).

Although not included in v1 of the Block Proposer Policy, an additional criteria that may be considered for relay providers going forward is whether they allow for external block builders to submit blocks to their relay. Currently the Flashbots,

bloXroute, and Eden relays allow for 3rd party builders to submit blocks, Manifold is in the process of re-implementing the feature, and Blocknative is considering what approach to take.

Notable Incidents:

1. On September 21st, a number of Lido Node Operators missed block proposals due to an issue with the bloXroute max profit relay failing to unblind blocks. Later that day, the bloXroute team put out a [public statement](#) disclosing 88 total missed blocks due to the service outage and later repaid validators for each missed slot.

2. On September 27th, bloXroute disclosed an issue where the ethical relay began receiving and returning bad blocks to validators from an internal block builder running an experimental build strategy that resulted in missed slots. BloXroute remedied this by repaying all missed slots for the bids received and added functionality to ensure all bloXroute relays simulate block submissions regardless of the source.

3. On October 8th, Eden's API reported the wrong values for certain blocks due to a [bug in the reference builder implementation](#). The team publicly shared a fix for the issue and repaid the missed fee to the validator.

4. ** On October 15th, an issue was discovered with the Manifold relay where block rewards were not matching the declared reward in the blinded block. This was due to a 3rd party block builder noticing that the verification of block rewards for blocks submitted to the relay had been disabled, allowing for blocks to be submitted with wrongly declared block rewards. Details of the incident were later shared in a post mortem report through the Manifold Finance telegram channel on October 22nd: [Postmortem of incident on 2022-10-15 - HackMD](#). The Manifold team has notified Lido that they intend to reimburse validators for the missed rewards. Given pending reimbursement and the magnitude of the incident, most Lido Node Operators have disabled the Manifold relay for the time being.

Relay Proposals:

Given conversations with Lido Node operators and the prior context, including the suggested requirements of allowed relays, relay provider's introductions to the Lido community, and the incidents discussed above, the following relays are suggested for the initial "must-include" and "allow" lists.

Must-Include List:

- Blocknative

- bloXroute

- Eden

- Flashbots

Allow List:

- Manifold Finance

The proposal to include Manifold's relay in the "Allow-list" reflects discussions with Lido Node Operators, pending resolution, and additional time needed to stress-test the relay post mitigation.

After appropriate time for discussion over the next week, the following lists will be put up for snapshot vote, followed by a vote through Aragon to populate the on-chain contract deployed under LIP-17.

Placement on either the "must-include" or "allow" lists are not final. Going forward these lists will be reviewed and updated on an at-least yearly basis, though given the early-stage of MEV-Boost infrastructure, the list will likely be reviewed before the end of Q1'23.

We invite all Lido stakeholders and the Ethereum community to weigh in on these proposed lists. Additional updates have also been proposed in the [Lido on Ethereum Block Proposer Rewards Policy v2.0](#) where we invite broader discussion on the protocol's MEV related policies.