Calculating AEP license fees

This document will help you calculate your Orbit chain's Protocol Net Revenue and AEP license fees.

Before we define "Protocol Net Revenue," let's explain how fees work in a standard Orbit chain. From there, we can connect how each fee equates to a revenue or a cost.

Sequencing revenue

In a vanilla Orbit chain (a chain without customizations, transaction ordering policies, or other add-ons), users and dApps will pay a single gas fee to submit their transactions. Under the hood, however, a user's fee is allocated across four components used by the network in different ways. These four fee components are split as follows:

- l2BaseFee
- : fees paid to execute a transaction on the Orbit chain.
- l2SurplusFee
- : surplus fees are charged in addition to the base fee when an Orbit chain is congested.
- l1BaseFee
- : fees paid to cover the cost of an Orbit chain posting its settlement transaction to the parent chain.
- l1SurplusFee
- : an additional surplus fee that can be configured to award extra fees to the batch poster.

Based on the above, we interpret that an Orbit chain's revenue sources include all fee components: l2BaseFee , l2SurplusFee , l1BaseFee , and l1SurplusFee . However, one of these fee components is also a cost: l1BaseFee , as it is used to pay for parent chain settlement.

Assertion costs

The above fee system applies to an Orbit chain's Sequencer and Batch Poster, but there is another important actor that is considered essential to the chain. These are the **validators .**

Validators are responsible for posting assertions on the parent chain, which are disputable claims about the new state of the Rollup. Posting an assertion is what progressed chain state on the parent chain. Validators are also responsible for securing the chain by creating disputes on false assertions.

As validators are necessary for chain security and chain progression, the gas costs paid by validators are a cost under the AEP license.

The AEP license permits an Orbit chain to deduct the gas costs of assertion posting and confirming only for validators operated by the chain owner . The AEP Fee Router does not deduct assertion costs from its fees. In a later section, we will explain how chain owners can optionally deduct assertion costs.

Additional revenue sources

As the Orbit license allows chain owners to customize their Rollup, the AEP license accounts for revenue sources that could arise out of innovations. As such, it's worth noting that the total calculation of revenue will also include:

- Revenue from transaction ordering policies.
- Revenue earned through fees on top of the bridge.
- Broadly, any revenue earned in connection with your use of Arbitrum Nitro.

You can read the relevant legal terminology in Section 2 of the AEP Terms .

Calculating AEP fees

We are now in a place where we can precisely define AEP fees. An Orbit chain's obligation for AEP license is 10% of a chain's Net Protocol Revenue . Net Protocol Revenue is broadly the difference between (i) gross revenue and (ii) settlement costs.

Based on our understanding above, we can calculate AEP fees as follows.

AEP_FEES

=

[(gross revenue)

-

(settlement costs)] * 0.1 AEP_FEES

=

[(sequencing revenue + additional revenue)

-

(settlement costs + assertion costs)] * 0.1 AEP_FEES

=

[(l2BaseFee + l2SurplusFee + l1BaseFee + l1SurplusFee)

-

(l1BaseFee + assertion costs)] * 0.1

Opting in for assertion cost deduction

The AEP Fee Routerdoes not deduct assertion costs from the fees it routes. This is because the contract system cannot track the amount of gas validators spend, and it cannot determine the eligibility of a validator.

As such, Orbit chains can choose to deduct these costs from their fee stream, but this will require Orbit chains to self-report assertion costs and implement an intermediary multisig that sits before the AEP Fee Router system.

Instructions for doing so can be found below.

Eligible validators

Only validators directly associated with the Orbit chain owner are eligible for assertion cost deductions. By directly associated, we mean a validator operated by the team directly or contracted by an external provider (e.g., a Rollup-as-a-Service team) to act as a validator on behalf of the team. In the event of a contracted validator, only one validator can be eligible.

Eligible costs

The following costs can be deducted for an eligible validator:

1. The cost of posting assertions
2. The cost of confirming assertions
3. The cost of participating in fraud proofs

Deducting assertion costs

If a team elects to deduct their assertion posting costs from eligible validators, they must establish and obey the following process:

- Communicate to the Arbitrum Foundation that they intend to deduct on-chain assertion costs* Align on a cadence of disbursal and accounting these costs with the Arbitrum Foundation (e.g., quarterly, annually)
-
  - At this cadence, Provide on-chain accounting to the Arbitrum Foundation to substantiate deducted costs from the AEP Fee Router stream.

To implement the deduction, the team should do the following:

- [Configure all Orbit chain fee components](#)
- to send all fees to a secure multisig address.* For ease of accounting, it's strongly recommended that this multisig handle no funds other than the rewards earned from the protocol.
- On the established regular cadence (e.g., quarterly) deductall eligible assertion gas costs
- from the multisig's balance by transferring it to your preferred fee-collecting address. The remainder of the amount must be forwarded to theRewardDistributor
- contract (configured as directed previously)
- Following this, theRewardDistributor
- will split the post-deduction funds between theAEP Fee Router
- contracts and the configured chain-owner controlled addresses.

Special cases and exceptions

Certain Orbit configurations and customizations require special handling of AEP fees. The following is a non-exhaustive list of applicable scenarios and how to ensure AEP compliance. If any of the following cases apply, the recommended approach for fee handling will require manual handling of a portion of or all AEP Fees.

L2-Based Custom Gas Tokens

If you are an L3 or higher chain with a custom gas token, your custom gas token contract might be deployed on L2. If this L2 is not Arbitrum One, then the L2 token can be transferred via the AEP Fee Router, as this would first require bridging down to Ethereum (impossible for L2-based tokens). In this instance, we recommend your chain pay fees in ETH by manually sending fees to an ETH-configured routing system.

Non-Ethereum L1

If your Orbit chain is deployed on a non-Ethereum L1 (e.g., Solana, BNB Chain), your fees must be manually transferred to a Foundation-controlled address.

Novel Fee-Earning Customizations

As discussed above in Additional revenue sources, if you have customized your Orbit chain to earn revenue through any enshrined component, this revenue must be calculated as part of the AEP fees. In such cases, we recommend engaging with the AF to agree on a revenue model and reporting cadence and then manually send additional fees into the routing system as required.

Other cases

If you are still determining if your Orbit configuration applies to the listed or unlisted special cases, we recommend engaging with the Arbitrum Foundation. Edit this page Last updatedonOct 31, 2024 Previous Set up an AEP fee router Next Upgrade ArbOS