Building on the Arbitrum Nitro stack with Avail

What is nitro

Nitro is designed by Arbitrum, a software stack to build optimistic rollup, powering two major market cap chains - arbitrum one and arbitrum nova. These chains are Optimistic L2 protocols that inherit Ethereum-level security.

You can read more about Nitro in:

1. The Nitro whitepaper on github(opens in a new tab)
2. Arbitrum docs.(opens in a new tab)

What is Arbitrum Orbit integration with Avail DA

Chains created using Arbitrum Nitro Stack can be an L2 settling over ethereum or an L3 settling to any ethereum L2. The current nitro stack allows developers to deploy an orbit chain with Arbitrum One or Arbitrum Anytrust as DA layer. With the new Avail DA integration in nitro stack, a developer gets one more data availability provider option which can be enabled from node configuration.

Transaction Lifecycle

1. Transaction Submission
2.
    - Process
3.
    - : Users send transactions to the Sequencer.
4.
    - Role
5.
    - : The Sequencer temporarily holds the transactions before they are batched.
6. Batch Processing
7.
    - Component
8.
    - :Sequencer
9.
    - Function
10.
    - : Collects and order transactions into batches for more efficient processing.
11. Batch Submission on Avail
12.
    - component
13.
    - :arbnode/batch-poster
14.
    - Process
15.
    - : Sequencer post a batch of L2 transaction onto the underlying data availability provider
16. BlobPointer Reference Creation
17.
    - Outcome
18.
    - : Avail returns a unique transaction reference with Merkle proof of
19.
    - batch submission.
20. BlobPointer Submission to Settlement layer (Arbitrum one, ethereum etc.)
21.
    - Process
22.
    - : BlobPointer with Avail header byte(0x0a) is being sent over
23.
    - tosequencerInbox
24.
    - rollup contract for on-chain da verification over Avail
25.
    - bridge and batch addition to canonical chain.
26.

- component:
27.
- SequncerInbox.sol (opens in a new tab)
28. on-chain Data availability verification
29.
- Component
30.
- :Avail bridge (opens in a new tab)
31.
- Function
32.
- : VerifyMerkle proof
33.
- for the batch submission withdataRootCommitment
34.
- fromVectorX (opens in a new tab)
35.
- .
36. Replay batch execution over WASM binary STF
37.
- Component
38.
- :Arbitrator, ArbState
39.
- Process: Recover payload from Avail DA (RecoverPayloadFromAvailBatch (opens in a new tab)
40.
-),
41.
- and re-executes the State Transition Function against input messages to determine
42.
- the correct output block.

Arbitrum Nitro Avail-powered Nitro chains