RPC methods

Although the majority of RPC methods follow the same behavior as in Ethereum, some methods might produce a different result, or add more information, when used on an Arbitrum chain. This page covers the differences in response body fields you'll find when calling RPC methods on an Arbitrum chain vs on Ethereum.

info Comprehensive documentation on all generally available JSON-RPC methods for Ethereumcan be found at ethereum.org . As Arbitrum hasgo-ethereum at its core, most of the documented methods there can be used with no modifications.

Transactions

When callingeth_getTransactionByHash and other methods that return a transaction, Arbitrum includes a few additional fields and leverages some existing fields in different ways than Ethereum.

Transaction types

In addition to thethree transaction types currently supported on Ethereum, Arbitrum adds additional types listed below anddocumented in full detail here .

On RPC calls that return transactions, thetype field will reflect the custom codes where applicable.

Transaction type code Transaction type name Description 100 ArbitrumDepositTxType Used to deposit ETH from L1 to L2 via the Arbitrum bridge 101 ArbitrumUnsignedTxType Used to call an L2 contract from L1, originated by a user through the Arbitrum bridge 102 ArbitrumContractTxType Used to call an L2 contract from L1, originated by a contract through the Arbitrum bridge 104 ArbitrumRetryTxType Used tomanually redeem a retryable ticket on L2 that failed to execute automatically (usually due to low gas) 105 ArbitrumSubmitRetryableTxType Used tosubmit a retryable ticket via the Arbitrum bridge on L1 106 ArbitrumInternalTxType Internal transactions created by the ArbOS itself for certain state updates, like the L1 base fee and the block number

Additional fields

On RPC calls that return transactions, the following fields are added to the returned object.

Field name Description requestId On L1 to L2 transactions, this field is added to indicate position in the Inbox queue

Existing fields with different behavior

On RPC calls that return transactions, the following fields will have a different content than what's received on Ethereum.

Field name Description from On L1 to L2 transactions, this field will contain thealiased version of the L1'smsg.sender

Transaction receipts

When callingeth_getTransactionReceipt , Arbitrum includes a few additional fields and leverages some existing fields in different ways than Ethereum.

Additional fields

On RPC calls that return transaction receipts, the following fields are added to the returned object.

Field name Description l1BlockNumber The L1 block number that would be used forblock.number calls. More information inBlock numbers and time gasUsedForL1 Amount of gas spent on L1 calldata in units of L2 gas. More information inGas and fees

Blocks

When callingeth_getBlockByHash and other methods that return a block, Arbitrum includes a few additional fields and leverages some existing fields in different ways than Ethereum.

Additional fields

On RPC calls that return a block, the following fields are added to the returned object.

Field name Description l1BlockNumber An approximate L1 block number that occurred before this L2 block. More information inBlock numbers and time sendCount The number of L2 to L1 messages since Nitro genesis sendRoot The

Merkle root of the outbox tree state

Existing fields with different behavior

On RPC calls that return a block, the following fields will have a different content than what's received on Ethereum.

Field name Description extraData This field is equivalent tosendRoot mixHash First 8 bytes is equivalent tosendCount , second 8 bytes is equivalent tol1BlockNumber difficulty Fixed at0x1 gasLimit Value is fixed at0x4000000000000 , but it's important to note that Arbitrum One currently has a 32M gas limit per block. SeeChain params for the gas limit of other chains

Other methods that are slightly different

eth_syncing

Callingeth_syncing returns false when the node is fully synced (just like on Ethereum). If the node is still syncing,eth_syncing returns an object with data about the synchronization status. Here, we provide more details.

Understanding messages, batches, and blocks

Nitro nodes receive transactions from their parent chain and the sequencer feed in the form of messages. These messages may contain multiple transactions that are executed by the node, which then produces blocks. Each message produces exactly one block. In most Nitro chains, the message number and the block number are the same. However, Arbitrum One has pre-Nitro (classic) blocks, so for that chain, message 0 produced block22207818 (blocks prior to that one are 'classic' blocks). Keep in mind that the offset between message and block number is constant in the chain.

On the parent chain, messages appear in batches. The number of messages per batch changes between batches.

Custometh_syncing

fields

info Note that the exact output for theeth_syncing RPC call of an out-of-sync Nitro node is not considered a stable API. It is still being actively developed and can be modified without notice between versions. Field name Description batchSeen Last batch number observed on the parent chain batchProcessed Last batch that was processed on the parent chain. Processing means dividing the batch into messages messageOfProcessedBatch Last message in the last processed batch msgCount Number of messages known/queued by the Nitro node blockNum Last block created by the Nitro node (up-to-date L2 block the node is synced to) messageOfLastBlock Message that was used to produce the block above broadcasterQueuedMessagesPos If different than 0, this is expected to be greater thanmsgCount . This field notes a message that was read from the feed but not processed because earlier messages are still missing lastL1BlockNum Last block number from the parent chain that Nitro sees. This is used to debug the connection with the parent chain lastl1BlockHash Last block hash from the parent chain that Nitro sees. This is used to debug the connection with the parent chain info Note that if the sync process encounters an error while trying to collect the data above (not expected) this error will be added to the response.

Understanding common scenarios

- IfbatchSeen
- batchProcessed
- , some batches have still not been processed
- IfmsgCount
- messageOfLastBlock
- , some messages have been processed, but not all relevant blocks have been built (this is usually the longest stage while syncing a new node)
- IfbroadcasterQueuedMessagesPos
- msgCount
- , the feed is ahead of the last message known to the nodeEdit this page Last updatedonMar 7, 2024 Previous Block numbers and time Next Solidity support