How to upgrade ArbOS on your Orbit chain

This how-to provides step-by-step instructions for Orbit chain operators who want to upgrade ArbOS on their Orbit chain(s). Familiarity with ArbOS, Orbit, andchain ownership is expected. Note that Orbit chain owners have full discretion over when and whether to upgrade their ArbOS version.

The specific upgrade requirements for each ArbOS release are located under each reference page for that specificArbOS release .

How often should I be upgrading my ArbOS version? It is strongly recommended to keep your Nitro's node software up-to-date as best you can to ensure you are benefting from the latest improvements to the Arbitrum technology stack. ArbOS version bumps are especially important because these upgrades change how Arbitrum nodes produce and validate assertions on a rollup's state.

Step 1: Update Nitro on nodes and validators

Refer to therequirements for the targeted ArbOS release to identify the specificNitro release that supports the ArbOS version that you're upgrading to. For example, if your upgrade targets ArbOS 20, you'd use Nitrov2.3.1 (Docker image:offchainlabs/nitro-node:v2.3.1-26fad6f) or higher. This is the version of the Nitro stack that needs to be running on each of your Orbit chain's nodes. A list ofall Nitro releases can be found on Github.

Begin by upgrading your validator node(s) to the specified Nitro version, then update each remaining Orbit node to match this version.

Note that upgrading your node versionmust occur before the deadline established for the target ArbOS upgrade. Refer to the timestamp in the ArbOS upgrade schedule for a precise deadline.

Step 2: Upgrade the Wasm module root & your chain's Nitro contracts

While every ArbOS upgrade will require an update to the Wasm module root, not every ArbOS upgrade will require an upgrade to the chain'snitro-contracts version. If necessary, as defined in the release notes for each ArbOS release, you may need to deploy new versions of some (or all) of the Nitro contracts to the parent chain of your Orbit chain. These contracts include the rollup logic, bridging logic, fraud proof contracts, and interfaces for interacting with Nitro precompiles.

To update the Wasm module root and deploy your chain's Nitro contracts to the parent chain for the most recent ArbOS release, you will need the following inputs (obtained from therequirements for the targeted ArbOS release):

- The WASM module root, and if necessary,
- The requirednitro-contracts
- version

Once you have the WASM module root and have identified the requirednitro-contracts version, if anyplease follow the instructions in this guide for specific actions based on thenitro-contracts version you are deploying. Note that each ArbOS release will require performing this step with a different Wasm module root and may potentially require a different version ofnitro-contracts . The guide linked above will be kept updated with the instructions for each specific ArbOS release.

TheWASM module root is a 32-byte hash, created from the Merkelized Go replay binary and its dependencies. When ArbOS is upgraded, a new Wasm module root is generated due to modifications in the State Transition Function. This new Wasm module root must be set in the rollup contract on the parent chain. You can get the For example, the Wasm module root for ArbOS 20 Atlas is0x8b104a2e80ac6165dc58b9048de12f301d70b02a0ab51396c22b4b4b802a16a4 .

To set the Wasm module root manually (i.e. not using the above guide), use theRollup proxy contract'ssetWasmModuleRoot method. Note that theupgrade executor contract on the parent chain is the designated owner of the rollup contract, so thechain owner account needs to initiate a call to theupgrade executor contract in order to perform the upgrade. This call should include the correct calldata for setting the new Wasm module root.

Backward compatibility Wasm module roots are backward compatible, so upgrading them before an ArbOS version upgrade will not disrupt your chain's functionality.

Step 3: Schedule the ArbOS version upgrade

To schedule an ArbOS version upgrade for your Orbit chain,follow this guide . In addition to the upgrade action contract address and the account address for the chain owner account, you will need the following inputs:

1. newVersion
2. : Specify the ArbOS version you wish to upgrade to (e.g.20
3.).
4. timestamp

5. : Set the exact Unix timestamp at which you want your Orbit chain to transition to the new ArbOS version.

If you would prefer to do this manually, simply call thescheduleArbOSUpgrade function on theArbOwner precompile of the Orbit chain(s) you're upgrading. Because this is an administrative action (similar to upgrading your Wasm module root), thechain owner account must call the target chain'supgrade executor contract with the appropriate calldata in order to invoke thescheduleArbOSUpgrade function of the ArbOwner precompile. This will schedule the ArbOS upgrade using the specified version and timestamp.

Immediate upgrades To upgrade immediately (without scheduling), set the timestamp to0 . Obtaining the current ArbOS version You can obtain the current ArbOS version of your chain by callingArbSys.ArbOSVersion() . Keep in mind that this function adds55 to the current ArbOS version. For example, if your chain is running on ArbOS 10, calling this function will return65 .

When scheduling the ArbOS upgrade throughArbOwner.scheduleArbOSUpgrade you must use the actual ArbOS version you're upgrading to. For example, if you're upgrading to ArbOS 11, you will pass11 when calling this function.

Step 4: Enable ArbOS specific configurations or feature flags (not always required)

For some ArbOS upgrades, such asArbOS 20 Atlas , there may be additional requirements or steps that need to be satisified to ensure your Orbit chain can use all of the new features and improvements made available in that particular ArbOS release.

If there are additional requirements for the targeted ArbOS release you're attempting to upgrade to, the additional requirements will be listed on the reference pages forthe targeted ArbOS release . For example, the additional requirements for Orbit chains upgrading to ArbOS 20 can be foundhere on the ArbOS 20 docs .

Congratulations! You've upgraded your Orbit chain(s) to the specified ArbOS version.Edit this page Last updatedonMar 19, 2024 Previous How to customize your Orbit chain's behaviorNext Keyset generation (AnyTrust chains)