What is Relay?

The fastest and cheapest way to bridge & transact across chains

Relay is a cross-chain payments system that enables instant, low-cost bridging and cross-chain execution. It works by connecting users with relayers - financial agents that act on users' behalfs across chains in exchange for a small fee. Relay is designed to minimize gas costs and execution latency, making it ideal for price-sensitive applications, such as payments, bridging, nft minting and gas abstraction.

It features the following key properties:

- Fast
- : Relayers can fill orders optimistically, even before payment is confirmed. Small payments can confirm in seconds.
- Cheap
- : As much logic as possible is performed off of expensive chains to reduce costs.
- Lightweight
- : Can operate on any chain with just a single relayer

How does it work?

Relay is powered by relayers. When a user wishes to bridge, they receive a quote from a relayer. They then accept the quote and submit a transfer to the relayer, who validates the order and sends the funds to the user on the destination chain. Relayers maintains a balance on all chains in order to make executions, and then periodically rebalance to ensure there is sufficient liquidity on all chains. Direct transfers are safe to send relayers because relayers post bonds in escrow that users may access in the case that a relayer does not fulfill their role.

Today Relay is powered by theReservoir Relayer . We are hard at work on theRelay Protocol , which will allow additional relayers to participate in Relay.

How is it so fast?

In traditional message-based bridges (LayerZero, Axelar, Wormhole, etc), there needs to be consensus amongst a group of actors that something happened on Chain A, before it can be acted upon on Chain B. This is because there are often shared liquidity pools on either side, and so you need to be certain that the action on Chain A was completed. For safety, this usually takes at least a couple of minutes.

By contrast, when using a relayer model (Relay, Across, etc), a single relayer executes the order on Chain B using their own funds. This means they don't need to wait for the action on Chain A to be fully confirmed, or to get consensus. When a user submits and order, the relayer fills as soon as possible, at which point the users desired intent is complete. This can happen in as little as a few seconds for low cost actions, like NFT mints and gas sponsorship.

How is it so cheap?

When bridging or swapping, there are typically three cost components:

- Asset transfer
- : Moving assets from one wallet to another
- Order validation
- : Ensuring that the user's order was fulfilled correctly
- Fee collection
- : Paying fees to actors such as a protocol, wallet or relayer

In most systems, order validation and fee collection happen on the same chain as asset transfer, which is usually a high-cost chain like Ethereum. In Relay, order validation and fee collection happen on a cheaper settlment chain, while asset transfers are reduced todirect transfers between the user and the relayer. This avoids the gas required when routing assets through onchain protocols. This reduces the cost to the absolute minimum possible. For example, for a crosschain bridge, the gas cost to use Relay is ~42,000 gas (origin & destination), while Across, thecheapest alternative, is roughly ~250,000 gas.

What chains are supported?

In many systems, expanding to a new chain requires deploying contracts, getting consensus amongst a network of actors, or deploying liquidity pools. With Relay, you just need a single relayer who is willing to operate on a chain, and it's permissionless for them to get started. This is critical in a world with an abundance of chains. If you are interested in having your chain supported, reach out!

Is it trustless?

Not yet! We are hard at work developing the Relay Protocol , a trustless system that allows users to interact with a permissionless set of relayers. However today, Relay is powered by Reservoir who is responsible for both order validation & relaying. We have mechanics in place to make sure orders are filled, and funds allocated in case of transaction failure. If you are interested in an enterprise agreement, please reach out.

Use Cases

Learn more about the powerful use cases that can be built on Relay:

Instant Bridging Get your docs set up locally for easy development ## Cross-chain Execution Preview your changes before you push to make sure they're perfect Instant Bridging twitter Powered by Mintlify