Interop message passing overview

Interop is currently in active development and not yet ready for production use. The information provided here may change. Check back regularly for the most up-to-date information. This guide provides an overview of cross-chain message passing in the Superchain.

Overview

The Superchain uses a pull-based event system for cross-chain communication. Messages are sent through theL2ToL2CrossDomainMessenger contract, which provides a secure and standardized way to pass information between chains.

How it works

The following diagram illustrates how messages flow between chains through theL2ToL2CrossDomainMessenger contract, which acts as a bridge for cross-chain communication. When a contract on the source chain initiates a message, it's processed through several stages before reaching its destination, ensuring secure and reliable message delivery.

Cross-chain messaging involves four main phases:

1. Message Creation
2. : The source chain contract emits an event containing the message data and destination information. This event serves as the initiating message that will be relayed across chains.
3. Message Serialization
4. : The messenger contract converts the event data into a standardized format that can be consistently processed across different chains in the Superchain.
5. Identifier Creation
6. : A unique identifier is generated for the message, containing information about itsorigin
7. ,timestamp
8. , and othermetadata
9. . This identifier helps track and verify the message.
10. Message Execution
11. : The destination chain receives and processes the message, executing any associated actions or state changes specified in the original message.

For detailed implementation steps and code examples, see ourmessage passing implementation guide(opens in a new tab).

Common Use Cases

- Simple messages between identical contracts
- Complex multi-contract interactions
- Cross-chain state synchronization
- Token transfers and bridging

For a practical example, see ourcross-chain ping pong tutorial(opens in a new tab).

Next steps

- Read about theanatomy of a cross-chain message
- TrySupersim
- for testing cross-chain messages locally
- Learn aboutmanually relaying messages(opens in a new tab)

SuperchainERC20 SuperchainWETH (Interoperable ETH)