



# 1inch Cross-chain swaps - Fusion+

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# Overview

- Classic Swap - AMM/PMM aggregation
- 1inch Fusion - intent-based swaps
- 1inch Fusion+ - cross-chain swaps
- Building projects for the cross-chain swap bounty

Swapping with 1 inch

# Supported Chains



Ethereum



BNB Chain



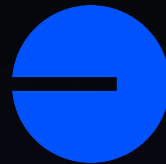
Polygon



Optimism



Arbitrum



Base



Avalanche



Gnosis Chain



zkSync Era



Sonic



Unichain



Linea

# Fusion



**Solana**

# Classic Swap

# Classic Swap

- Sources swap liquidity from all popular protocols
- Combines these protocols to optimize swap output
- Executes all swaps in a single transaction

# Classic Swap





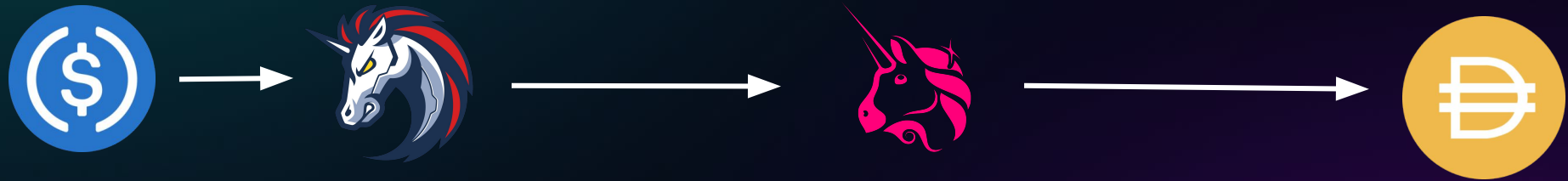
# Classic Swap



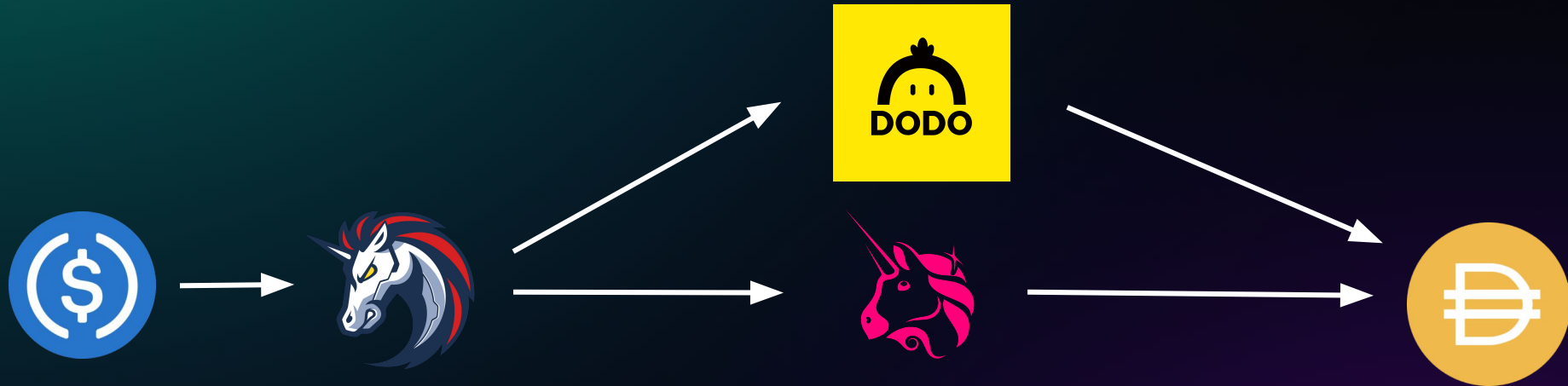
# Classic Swap



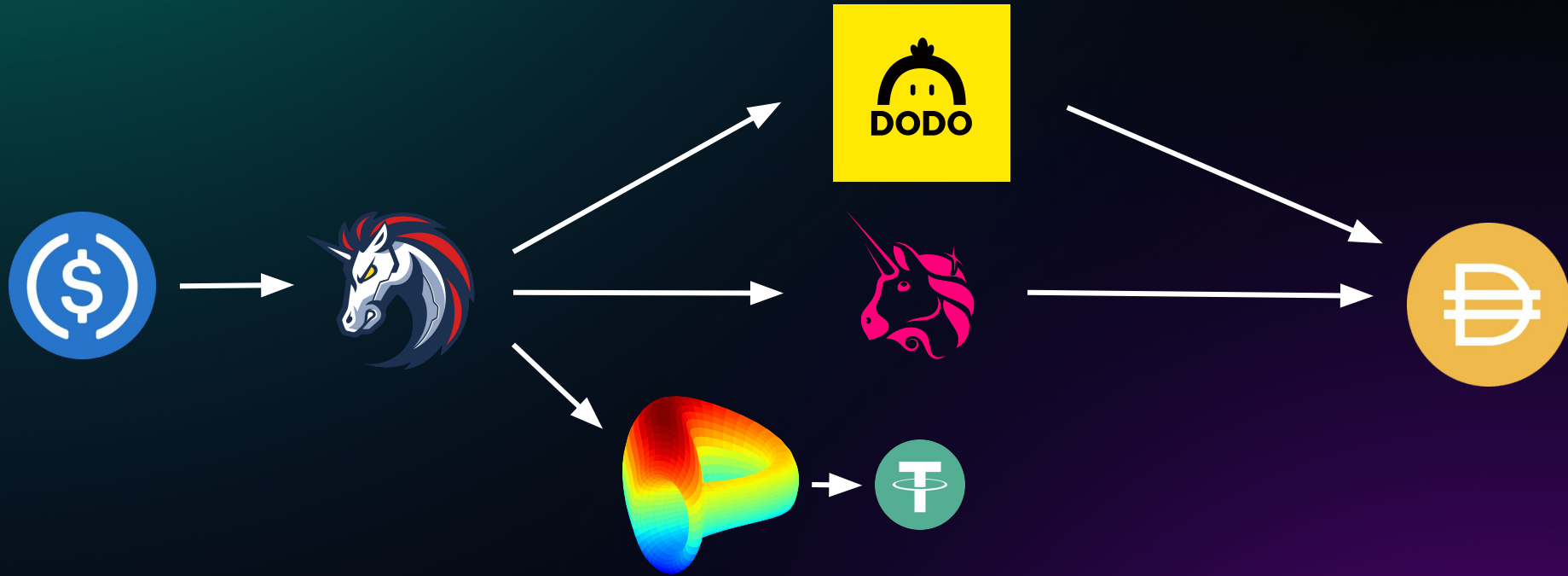
# Classic Swap



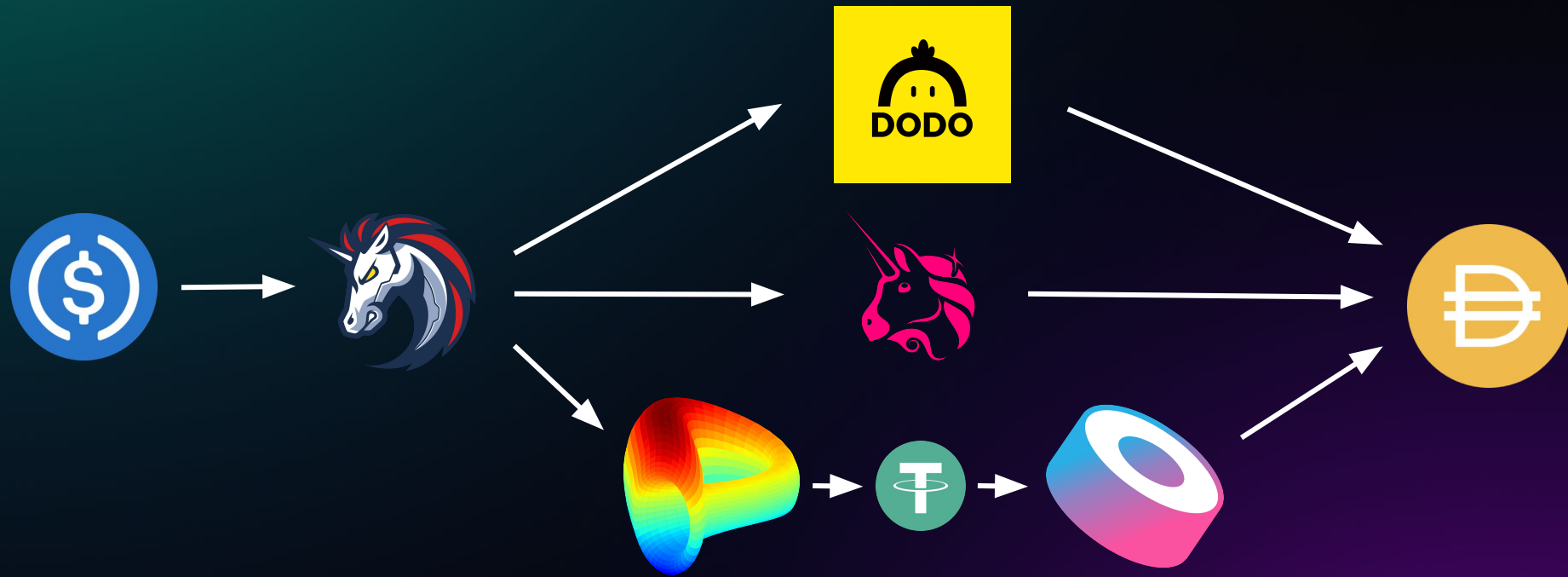
# Classic Swap



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# Classic Swap



## Classic Swap



**205,555 gas**



**175,055 gas**

## Classic Swap



**205,555 gas**



**✓ 175,055 gas**



1inch Fusion

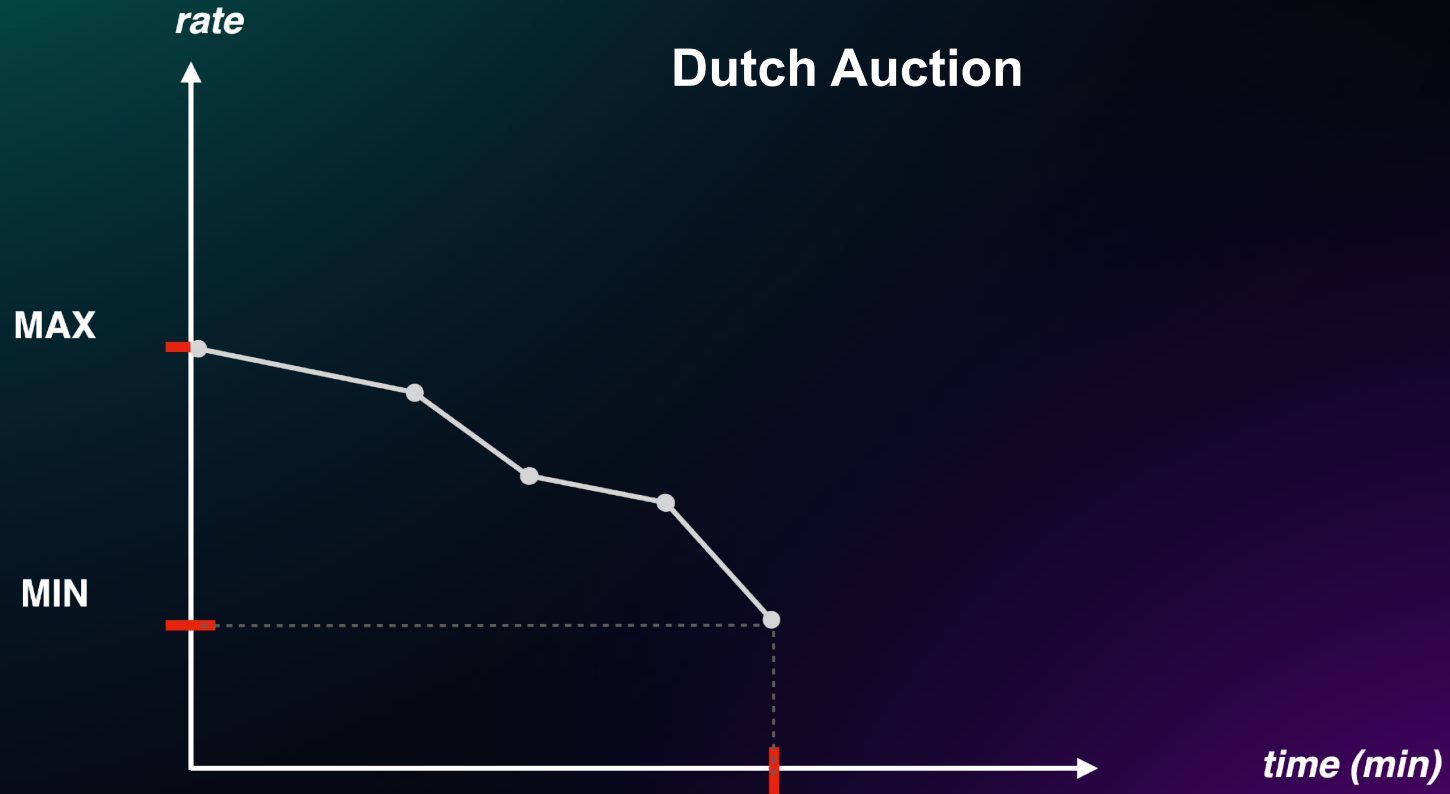
# 1inch Fusion

- User submits a swap request with signature
- Dutch auction is created for the swap
- Resolvers asynchronously compete to fill it
- Users are protected from MEV by design
- Gasless transaction for users

What is a Fusion dutch auction?

What is a Resolver?

# 1 inch Fusion



# 1inch Fusion



**user**

# 1inch Fusion



# 1inch Fusion





# 1inch Fusion



# 1inch Fusion



1inch API

# 1inch Fusion



1inch API



3 minute Fusion auction

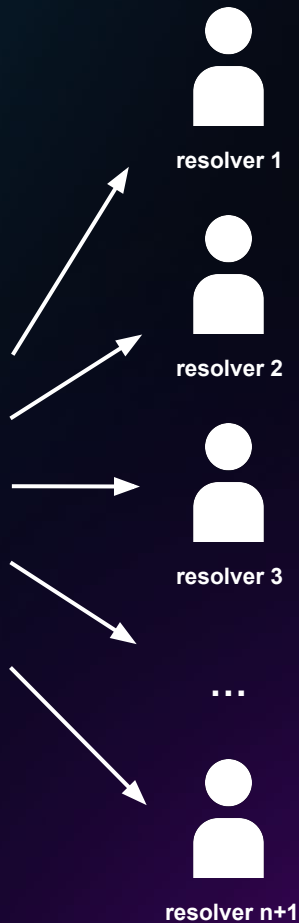
# 1inch Fusion



1inch API



3 minute Fusion auction



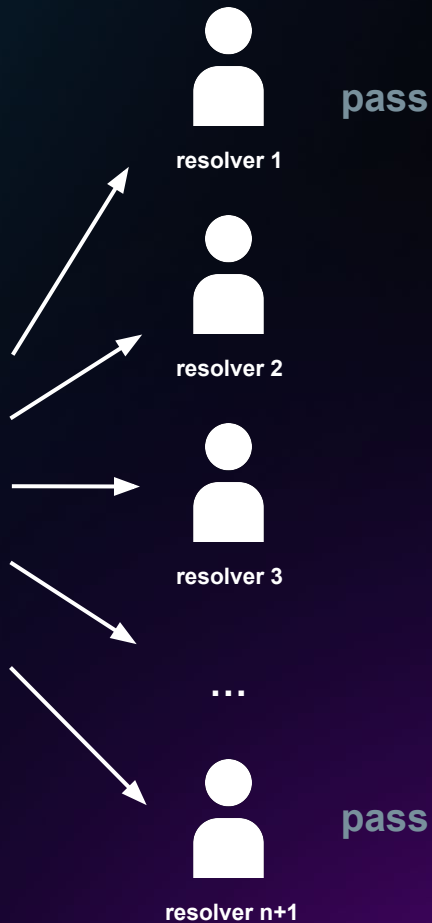
# 1inch Fusion



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3 minute Fusion auction



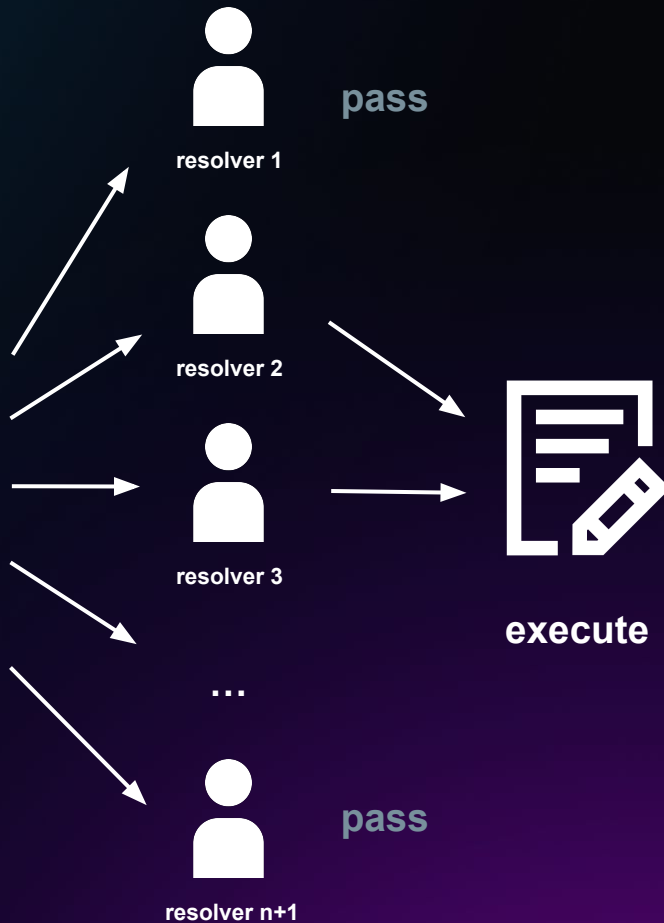
# 1inch Fusion



1inch API



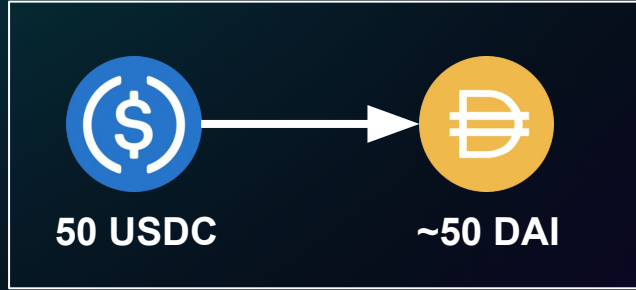
3 minute Fusion auction



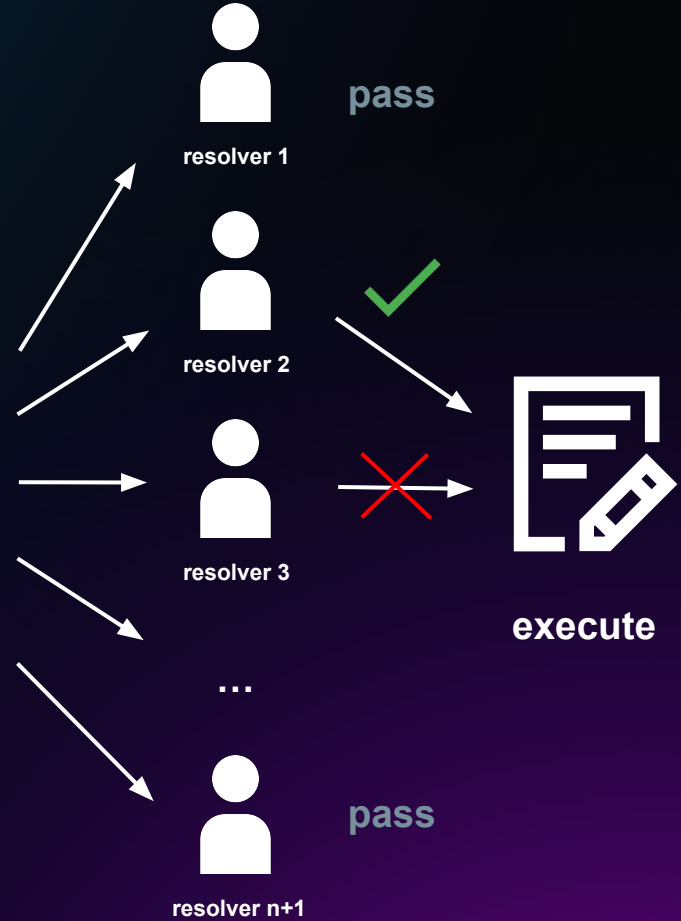
# 1inch Fusion



1inch API



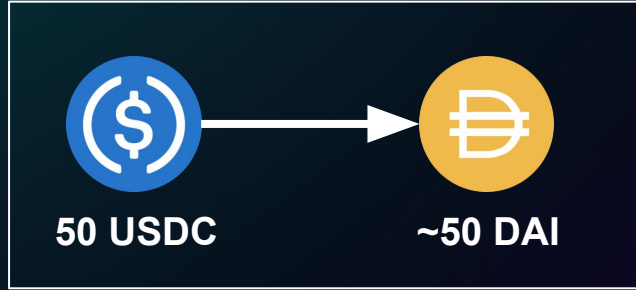
3 minute Fusion auction



# 1inch Fusion



1inch API



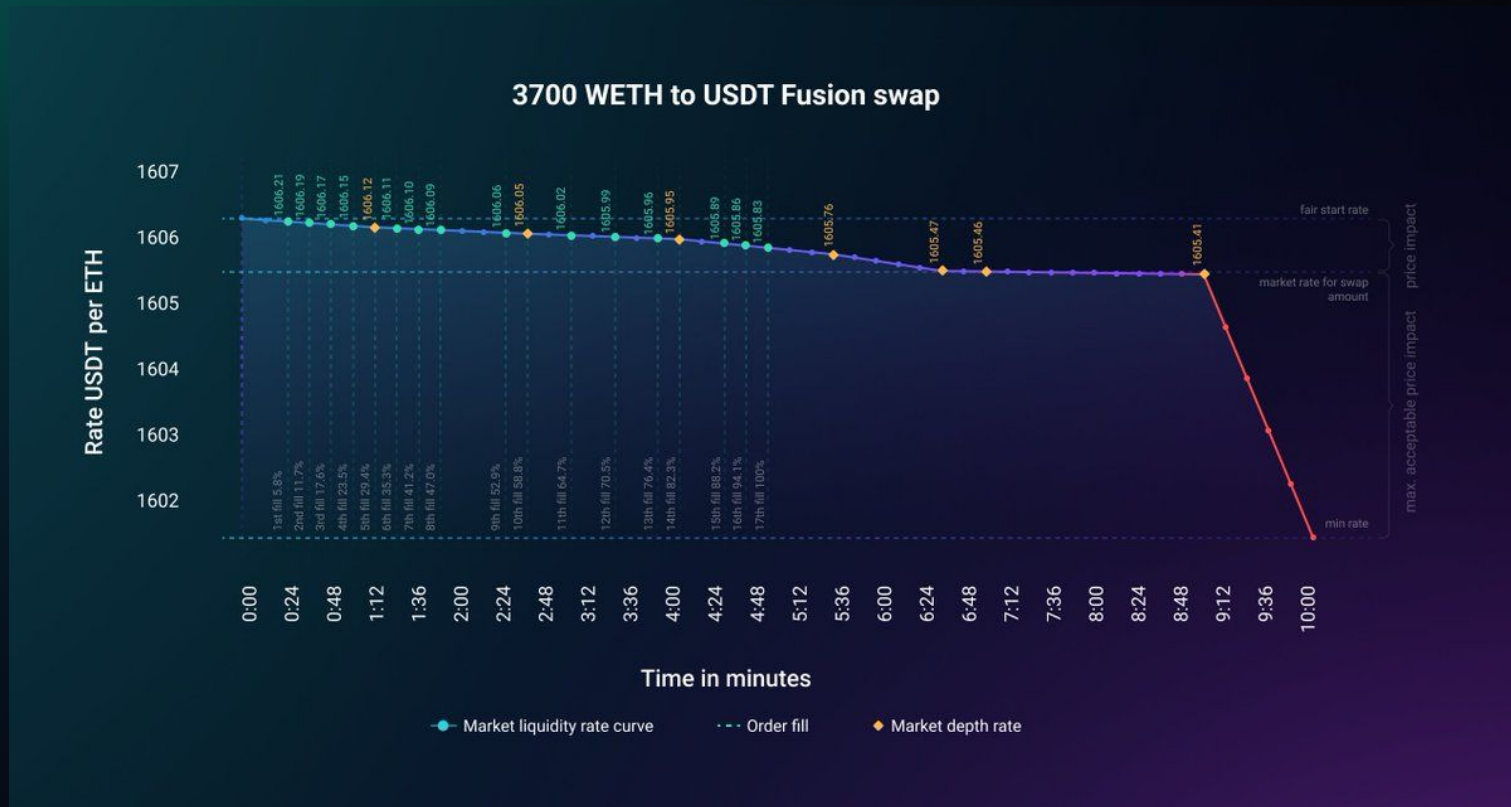
3 minute Fusion auction



execute



# 1 inch Fusion



Where do resolvers get liquidity?

# 1inch Fusion

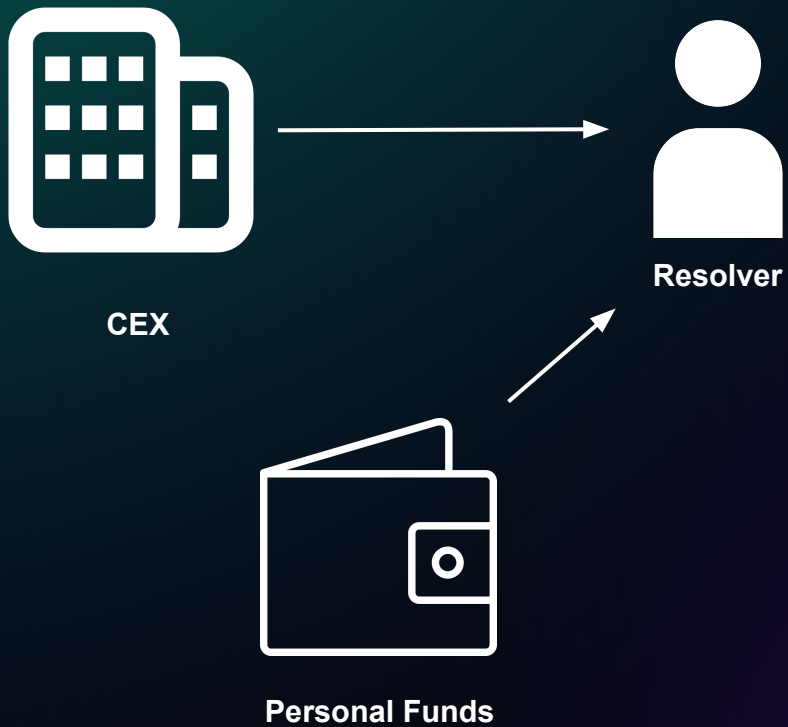


CEX

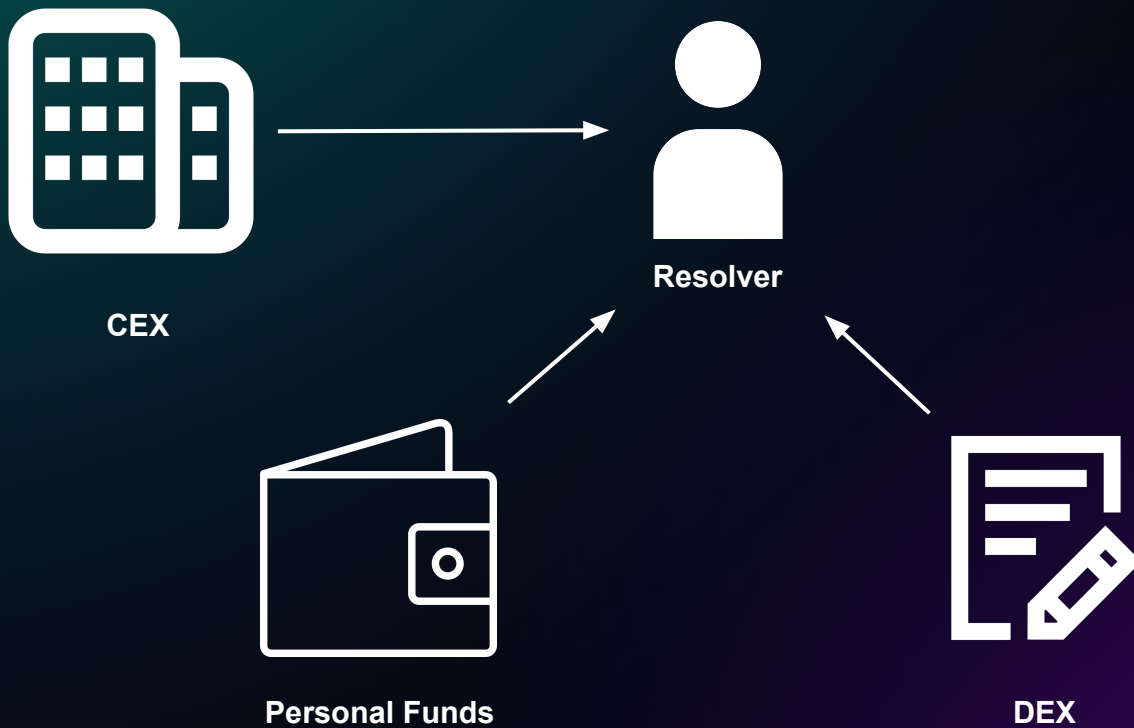


Resolver

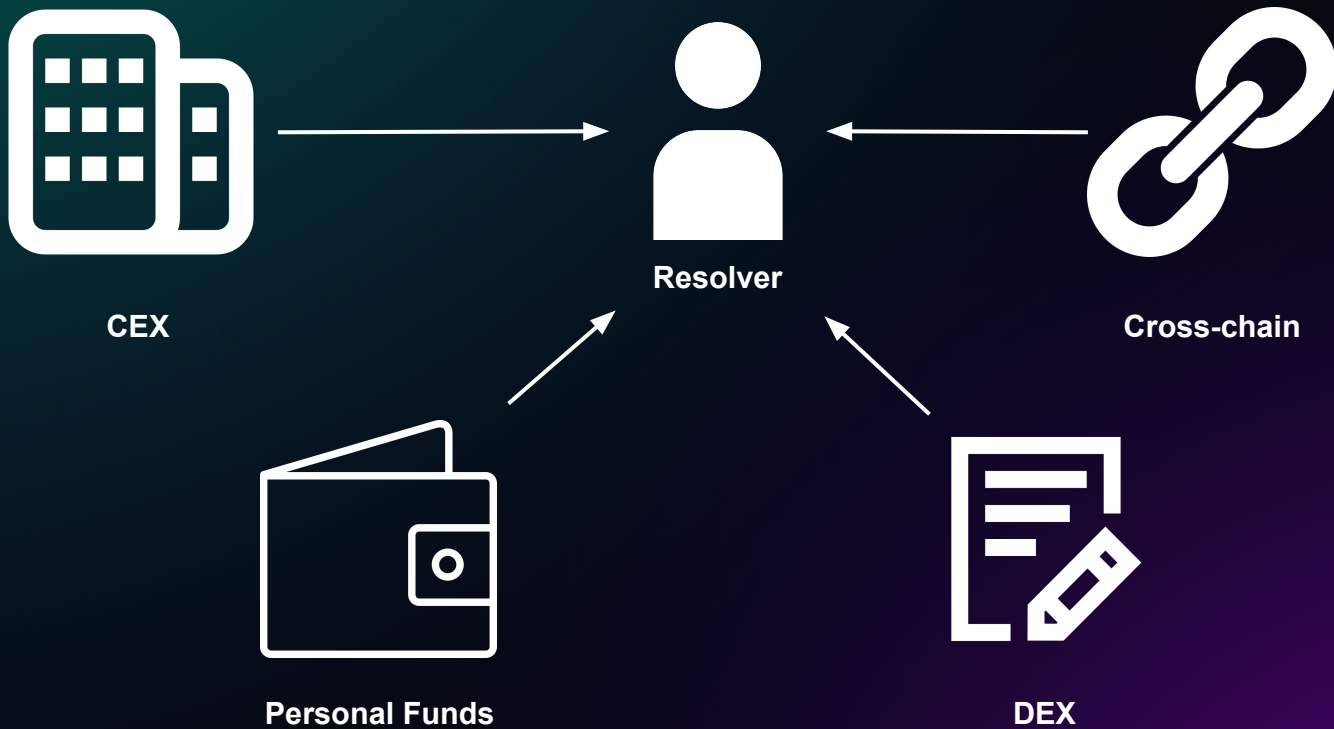
# 1inch Fusion



# 1inch Fusion



# 1inch Fusion



1 inch Fusion+

What matters to users for cross-chain swaps?



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Good swap rates

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Good swap rates

Simple UX

What matters to users for cross-chain swaps?

Good swap rates

Simple UX

Trustlessness

# Hashed Timelock Contracts

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- Smart contracts that hold funds

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  - Require some secret 's' to unlock the funds

# Hashed Timelock Contracts

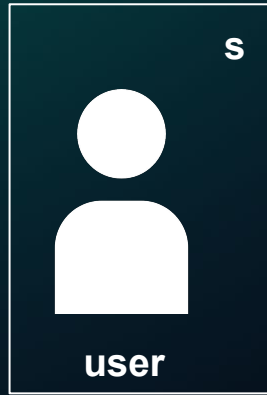
- Smart contracts that hold funds
  - Require some secret 's' to unlock the funds
  - Will expire after a set amount of time

# 1inch Fusion+

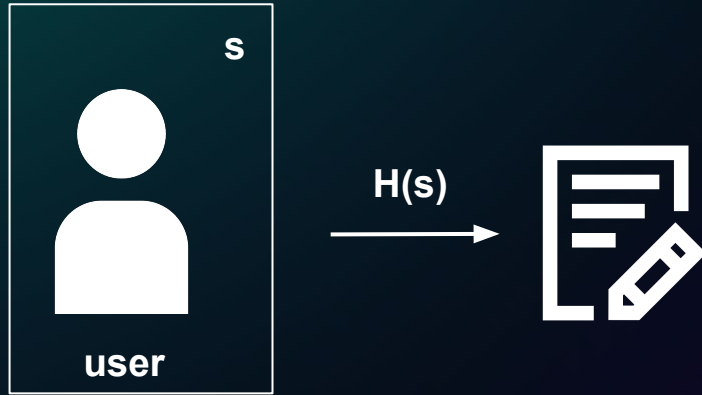




# 1inch Fusion+



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# 1 inch Fusion+

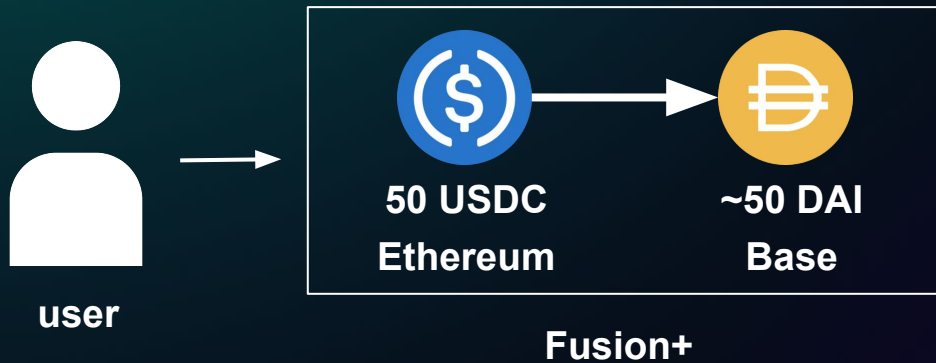


# 1inch Fusion+



**user**

# 1inch Fusion+



# 1inch Fusion+





# 1inch Fusion+



# 1inch Fusion+



1inch API

# 1inch Fusion+



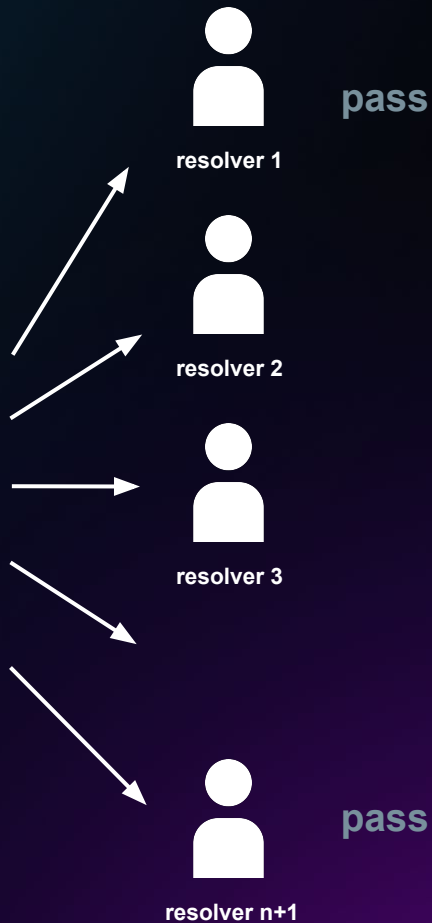
# 1inch Fusion+



1inch API



Dutch Auction



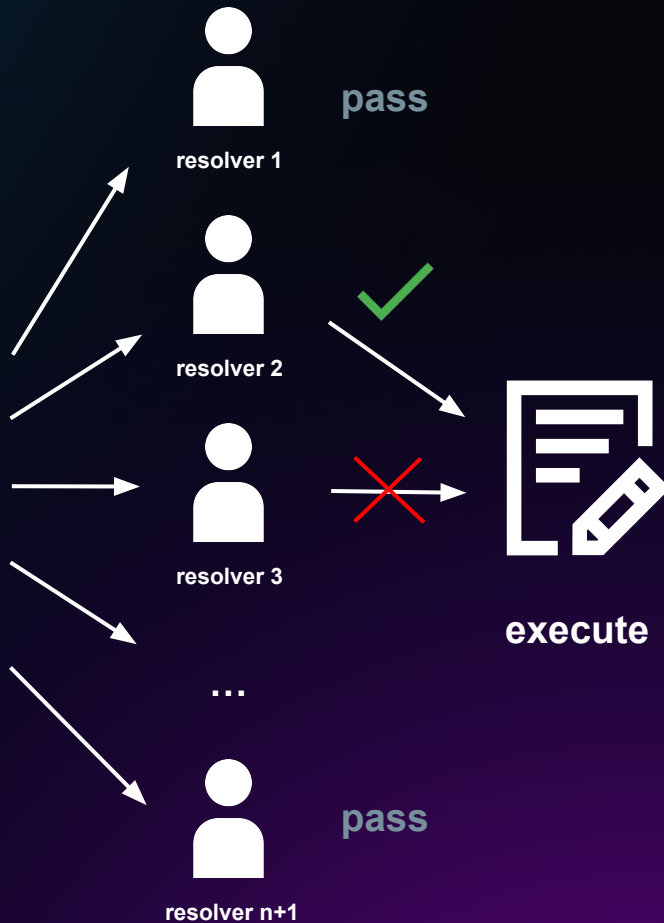
# 1inch Fusion+



1inch API



Dutch Auction



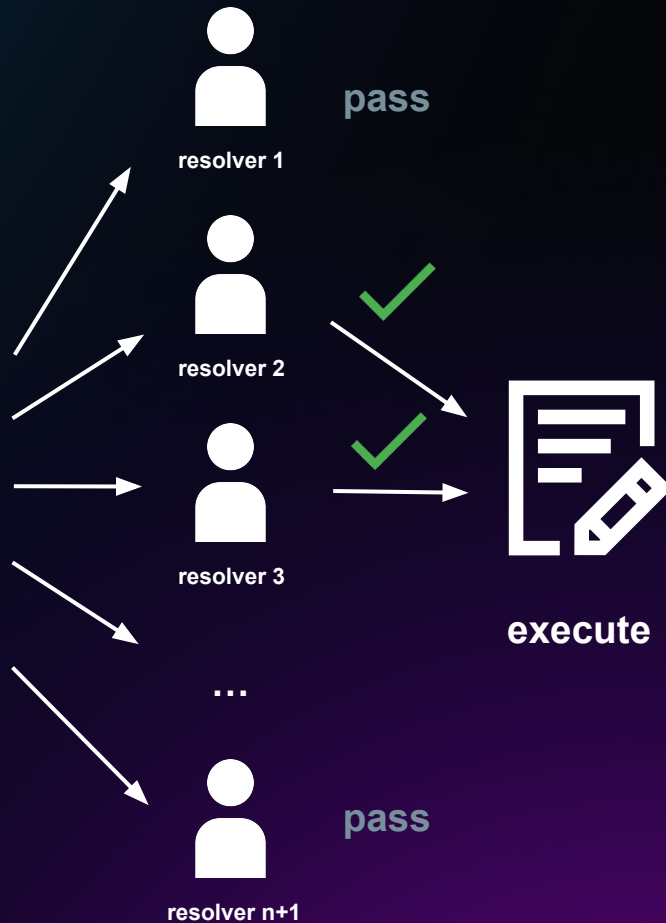
# 1inch Fusion+



1inch API



Dutch Auction



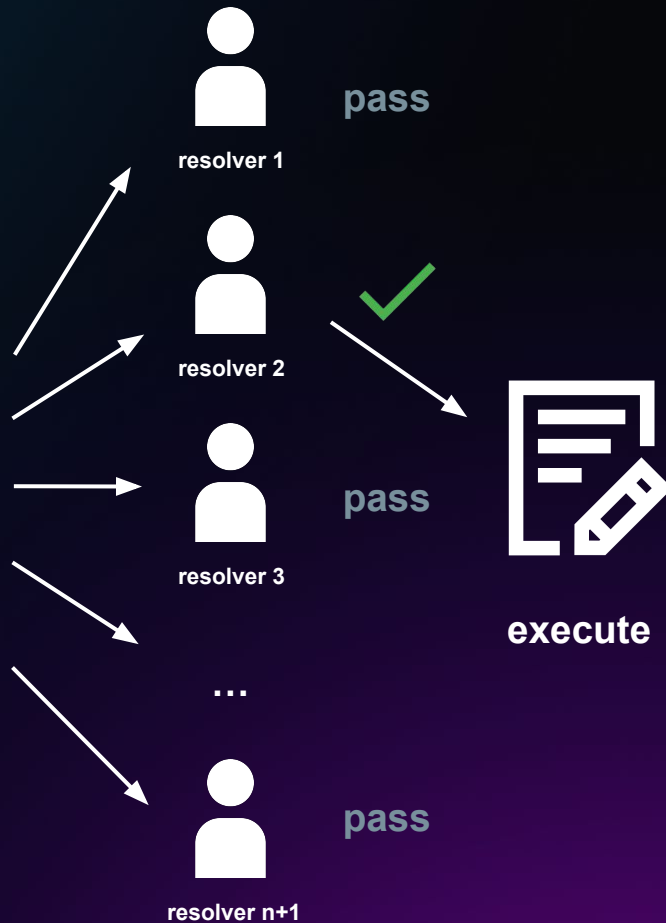
# 1inch Fusion+



1inch API



Dutch Auction



# 1inch Fusion+



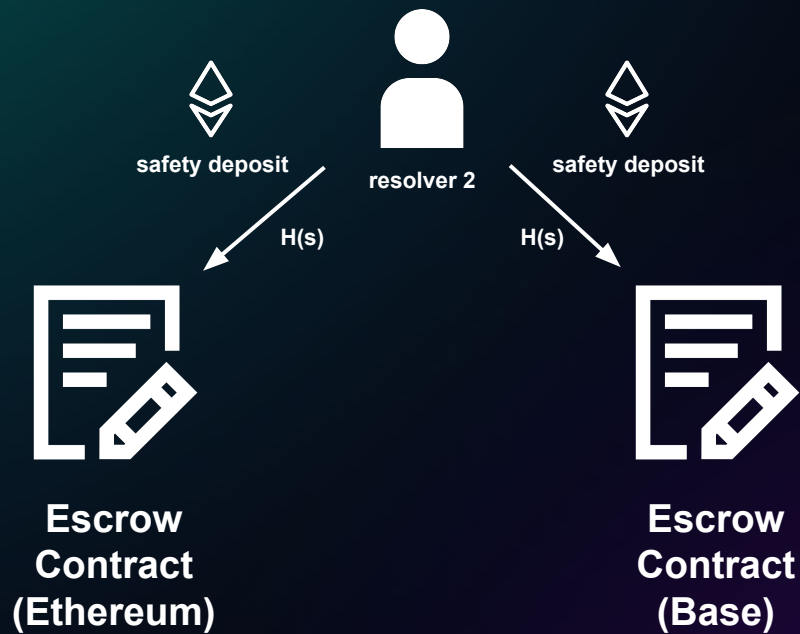
resolver 2



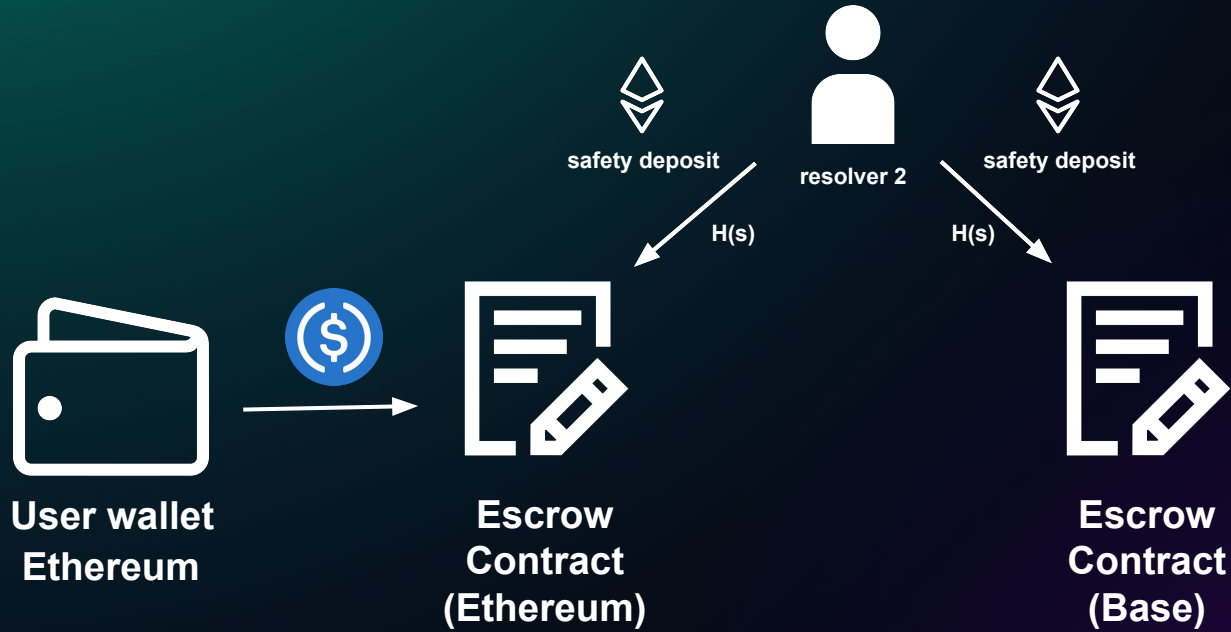
# 1inch Fusion+



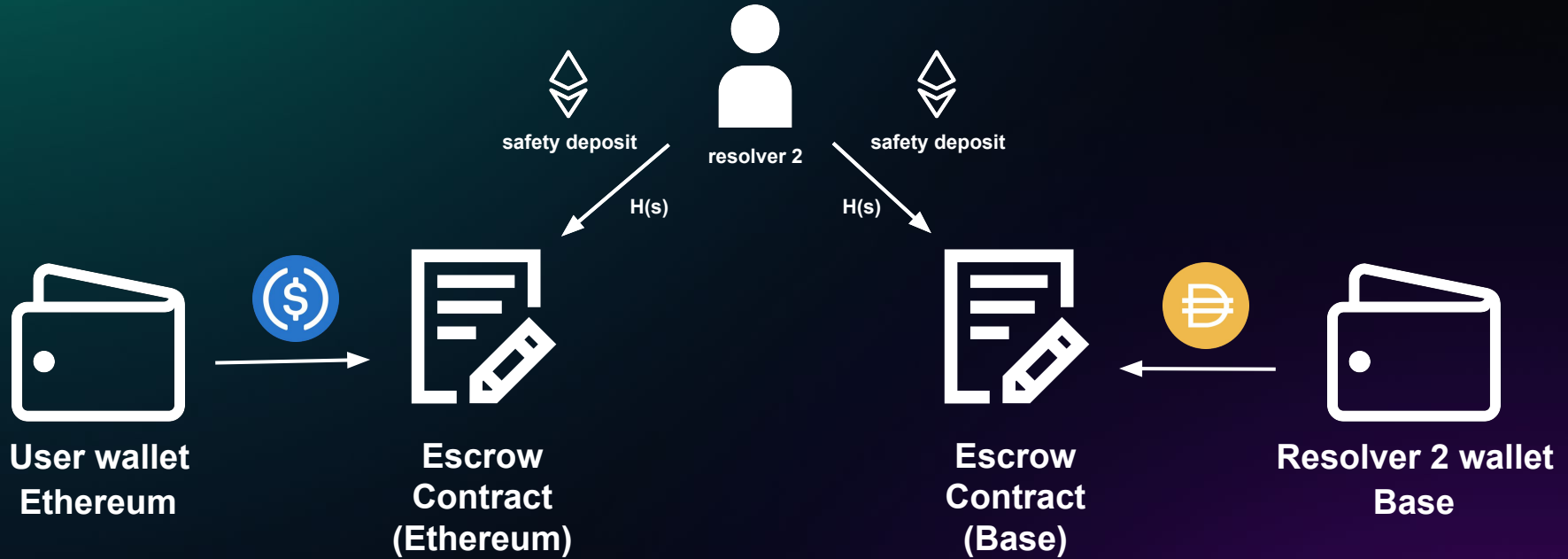
# 1inch Fusion+



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**Relayer**

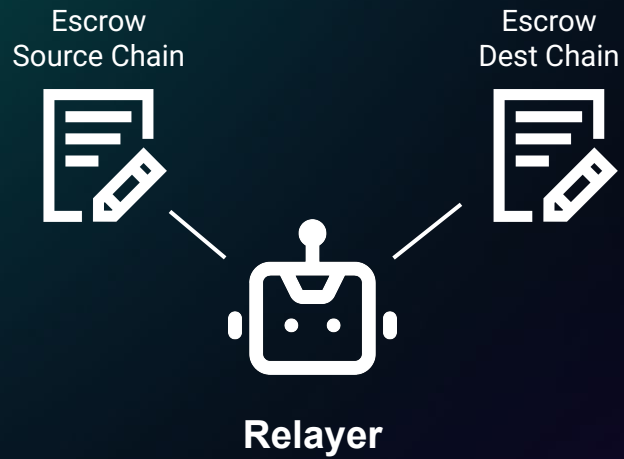
# 1inch Fusion+

Escrow  
Source Chain

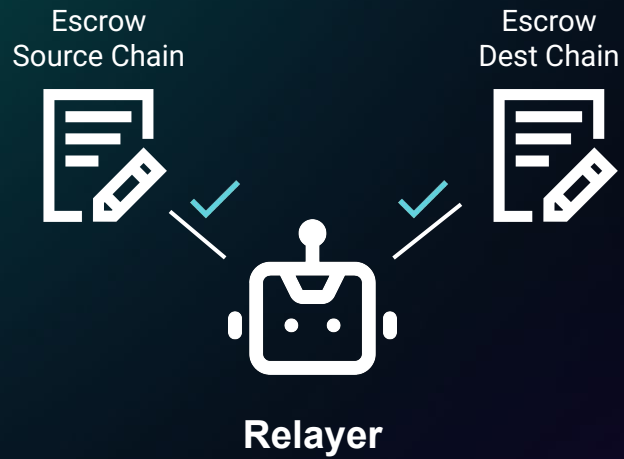


**Relayer**

# 1inch Fusion+

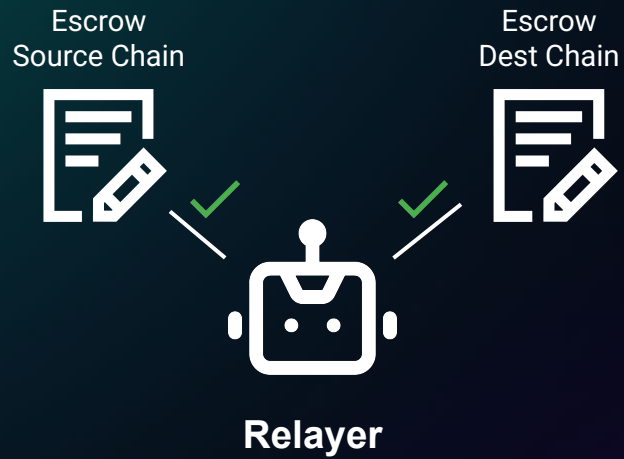


# 1inch Fusion+

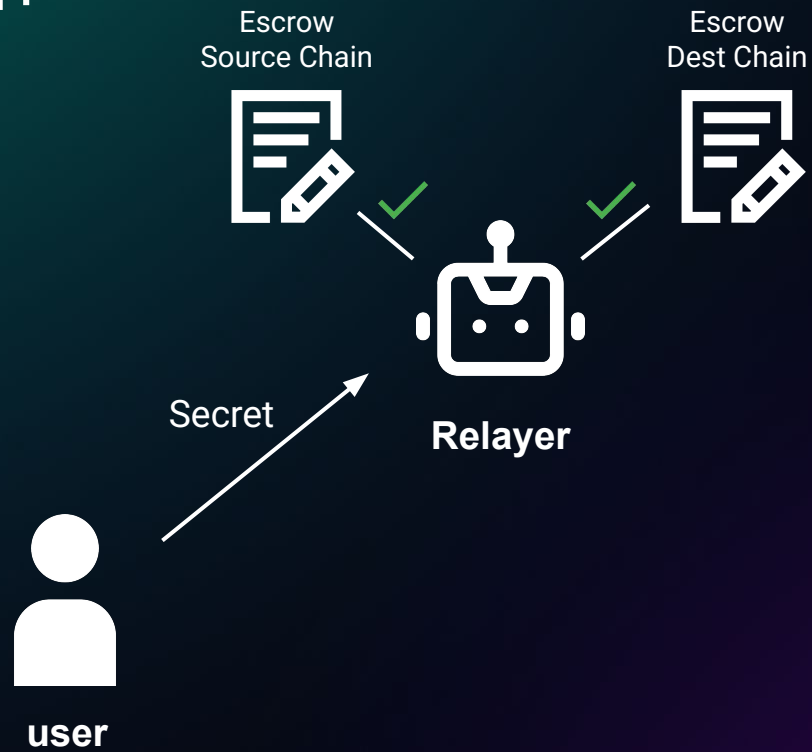




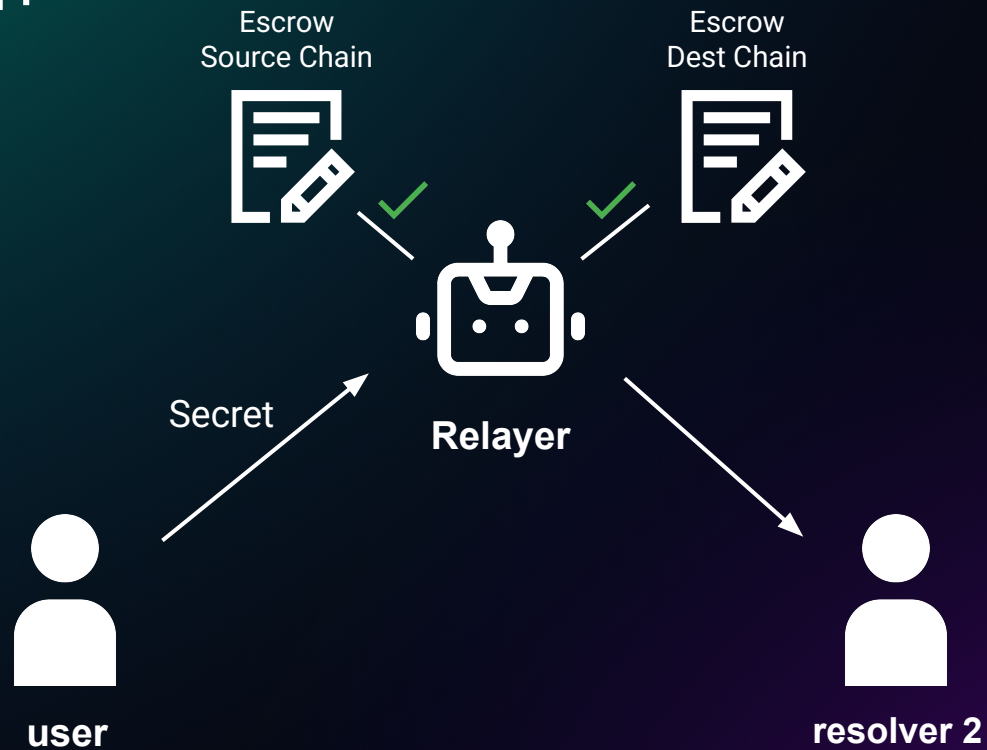
# 1inch Fusion+



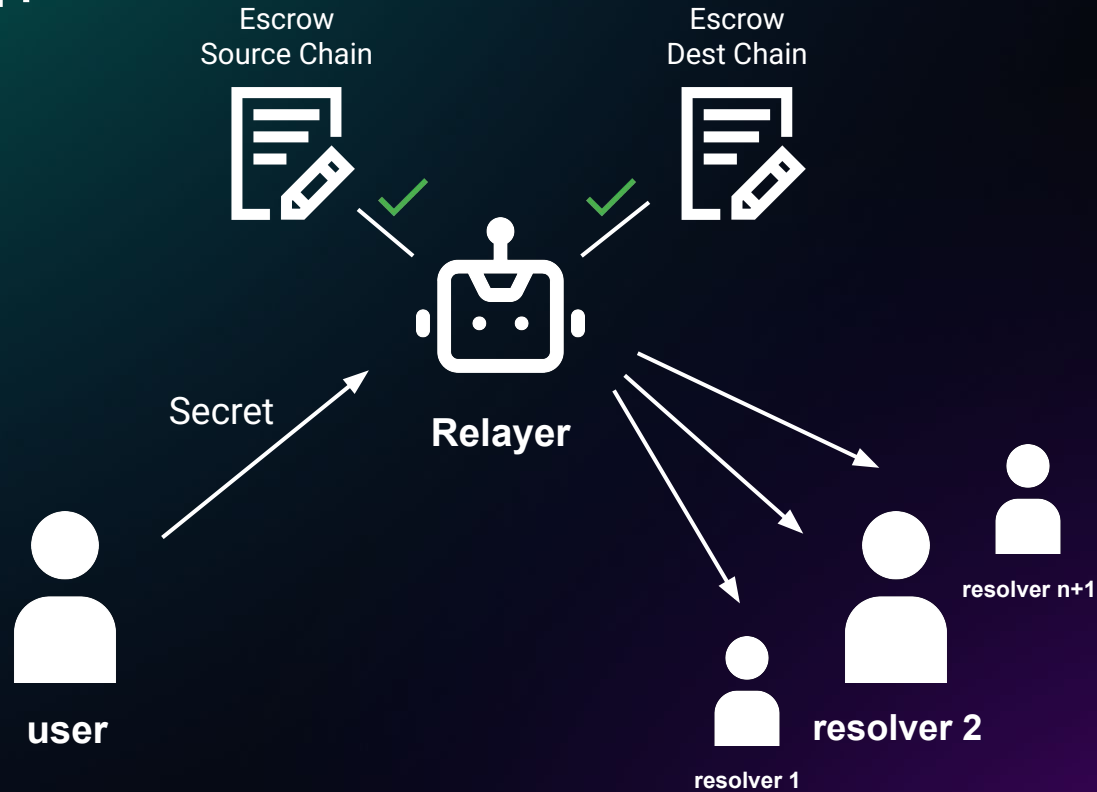
# 1inch Fusion+



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# 1inch Fusion+



Not limited to just EVM

# Integrating non-EVM chains

# Integrating non-EVM chains

- Your primary goal
  - Manage the HTLC and communication between an EVM chain and your non-EVM chain (all CLI/testnet is ok!)
    - Properly handle hashlock logic
    - Properly handle contract expiration/reverts
  - Swaps must be bi-directional

# Integrating non-EVM chains

EVM side

1inch Escrow Factory





# Integrating non-EVM chains

EVM side

1inch Escrow Factory



1inch Escrow



# Integrating non-EVM chains

EVM side

non-EVM side

1inch Escrow Factory



1inch Escrow



Your Escrow



# Integrating non-EVM chains

EVM side

non-EVM side

1inch Escrow Factory



1inch Escrow



Cross-chain orchestration

Your Escrow



# Integrating non-EVM chains

- Improving your score:
  - - UI
  - - Enable partial fills
  - - Relay and resolver
  - - Base/Arbitrum/etc. <-> mainnet non-EVM

# Important Note

## Integrating non-EVM chains

- Do not post any orders to our REST APIs
  - Your resolver will not work with our official backend system

Where do I start?

[github.com/1inch/cross-chain-resolver-example](https://github.com/1inch/cross-chain-resolver-example)



# Cross-chain Resolver Example

- Typescript
- Simulates a Fusion+ swap between Ethereum and BNB
- Has all information needed for the EVM side of your project

# Cross-chain Resolver Example

## cross-chain-resolver-example

### Installation

Install example deps

```
pnpm install
```

Install [foundry](#)

```
curl -L https://foundry.paradigm.xyz | bash
```

Install contract deps

```
forge install
```

### Running

To run tests you need to provide fork urls for Ethereum and Bsc

```
SRC_CHAIN_RPC=ETH_FORK_URL DST_CHAIN_RPC=BNB_FORK_URL pnpm test
```

### Public rpc

Chain	Url
Ethereum	<a href="https://eth.merkle.io">https://eth.merkle.io</a>
BSC	<a href="wss://bsc-rpc.publicnode.com">wss://bsc-rpc.publicnode.com</a>

Thank You

# Links

[hackathon.1inch.community](https://hackathon.1inch.community)

