# Gasless Meta-Transactions

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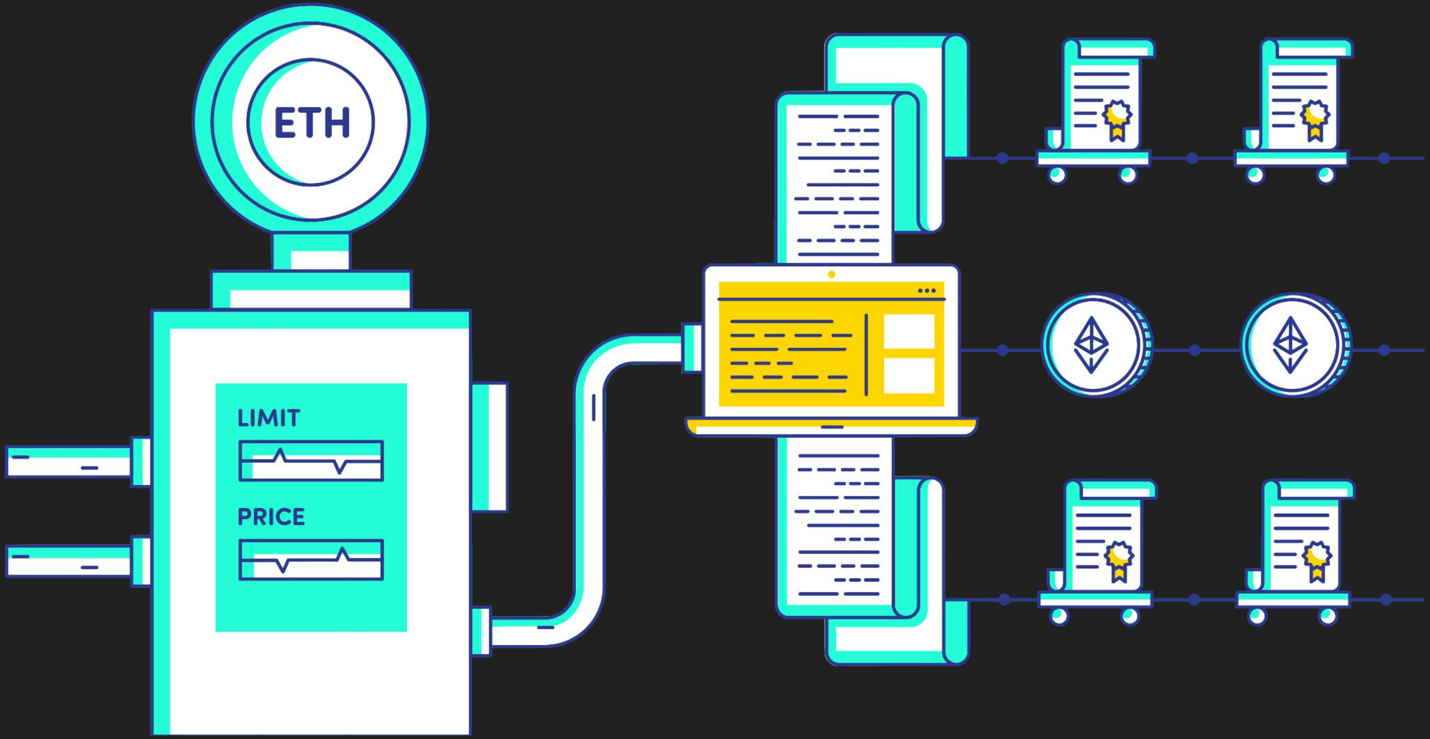
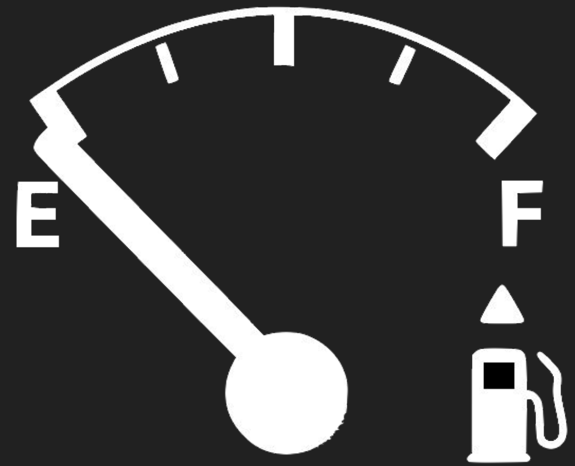
Avantis

## What Is Gas on Blockchain



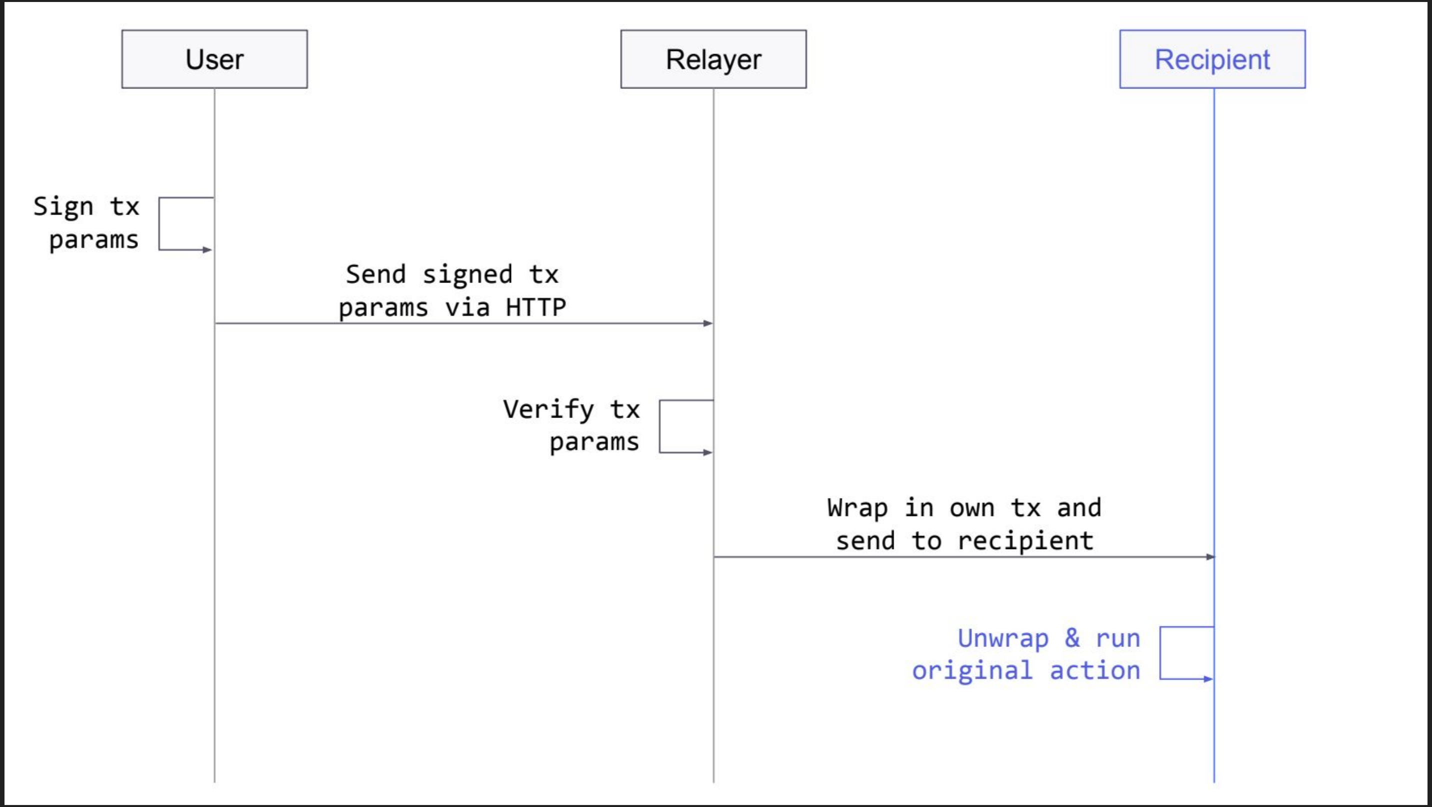
## Problem of Gas Fee

Impossible to perform action without gas

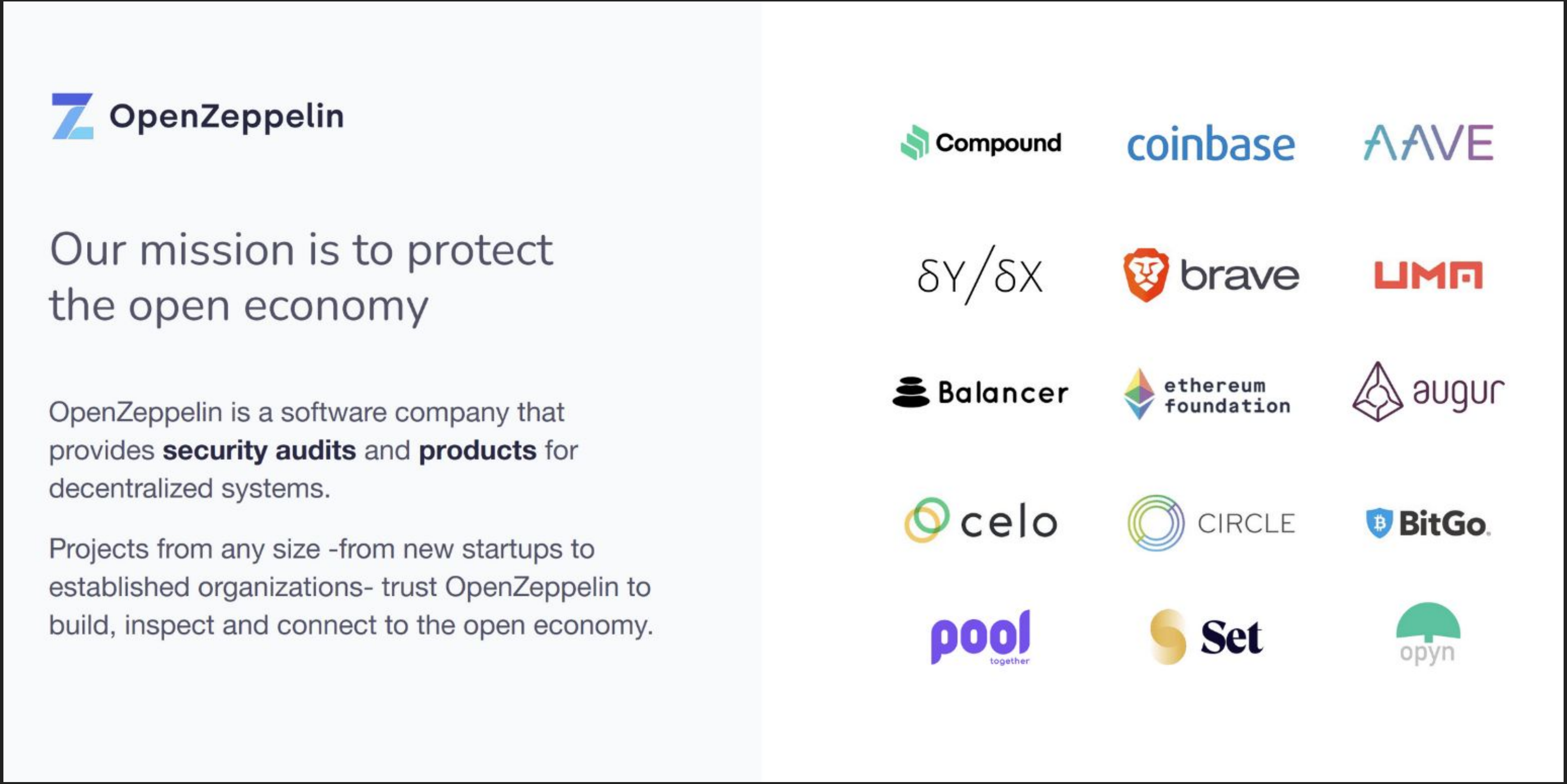


## Gasless Meta-transactions

# How do meta-transactions work?


User
Relayer
Recipient
Sign tx params
Send signed tx params via HTTP
Verify tx params
Wrap in own tx and send to recipient
Unwrap & run original action

# OpenZeppelin Defender



OpenZeppelin

Our mission is to protect the open economy

OpenZeppelin is a software company that provides **security audits** and **products** for decentralized systems.

Projects from any size -from new startups to established organizations- trust OpenZeppelin to build, inspect and connect to the open economy.

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coinbase
AAVE
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UMA
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Set
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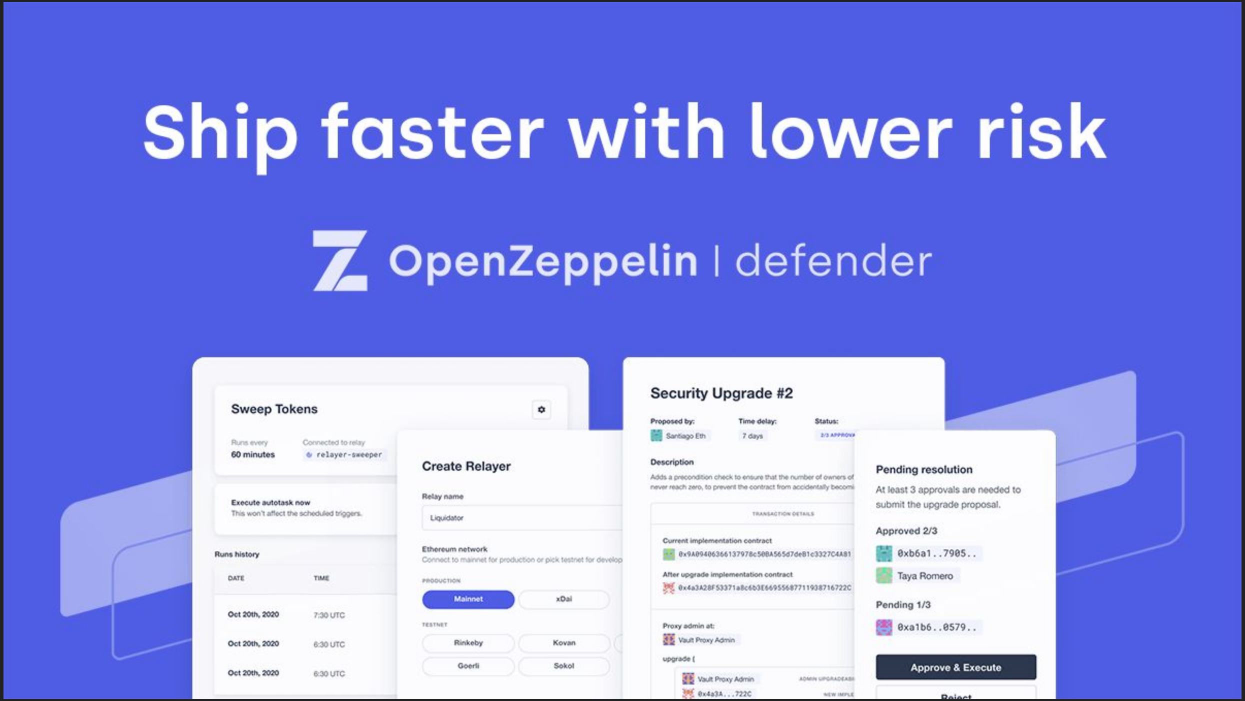
# OpenZeppelin Defender



Sweep Tokens

Runs every 60 minutes
Connected to relay relayer-sweeper

Execute autotask now
This won't affect the scheduled triggers.

Runs history

| DATE | TIME |
|---|---|
| Oct 20th, 2020 | 7:30 UTC |
| Oct 20th, 2020 | 6:30 UTC |
| Oct 20th, 2020 | 6:30 UTC |

Create Relayer

Relay name: Liquidator

Ethereum network
Connect to mainnet for production or pick testnet for develop

PRODUCTION: Mainnet, xDai
TESTNET: Rinkeby, Kovan, Goerli, Sokol

Security Upgrade #2

Proposed by: Santiago Eth
Time delay: 7 days
Status: 2/3 APPROVA

Description
Adds a precondition check to ensure that the number of owners of never reach zero, to prevent the contract from accidentally becomi

TRANSACTION DETAILS

Current implementation contract
0x9A09406366137978c508A565d7deB1c3327C4A81

After upgrade implementation contract
0x4a3A28F53371a8c6b3E669556877119387167 22C

Proxy admin at:
Vault Proxy Admin

upgrade (
Vault Proxy Admin — ADMIN UPGRADEABI
0x4a3A...722C — NEW IMPLE

Pending resolution
At least 3 approvals are needed to submit the upgrade proposal.

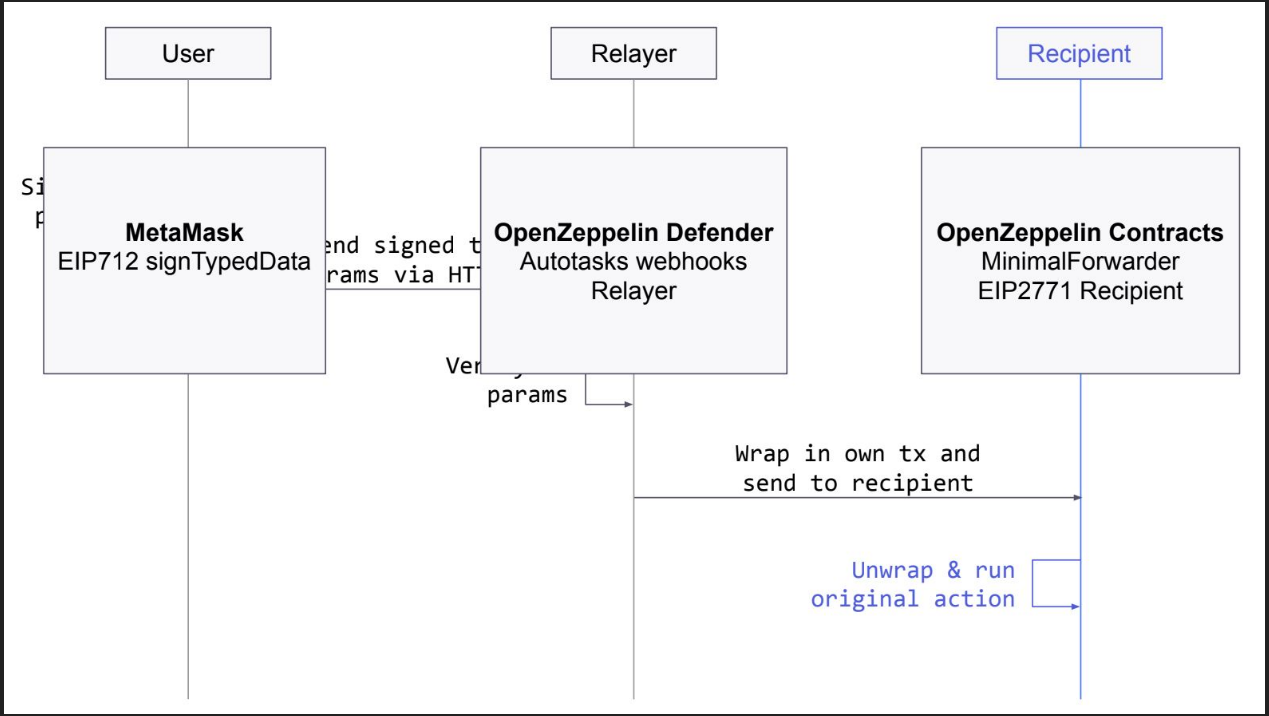
Approved 2/3
0xb6a1..7905..
Taya Romero

Pending 1/3
0xa1b6..0579..

Approve & Execute

Reject

# Implementation Using OpenZeppelin Contracts & Defender



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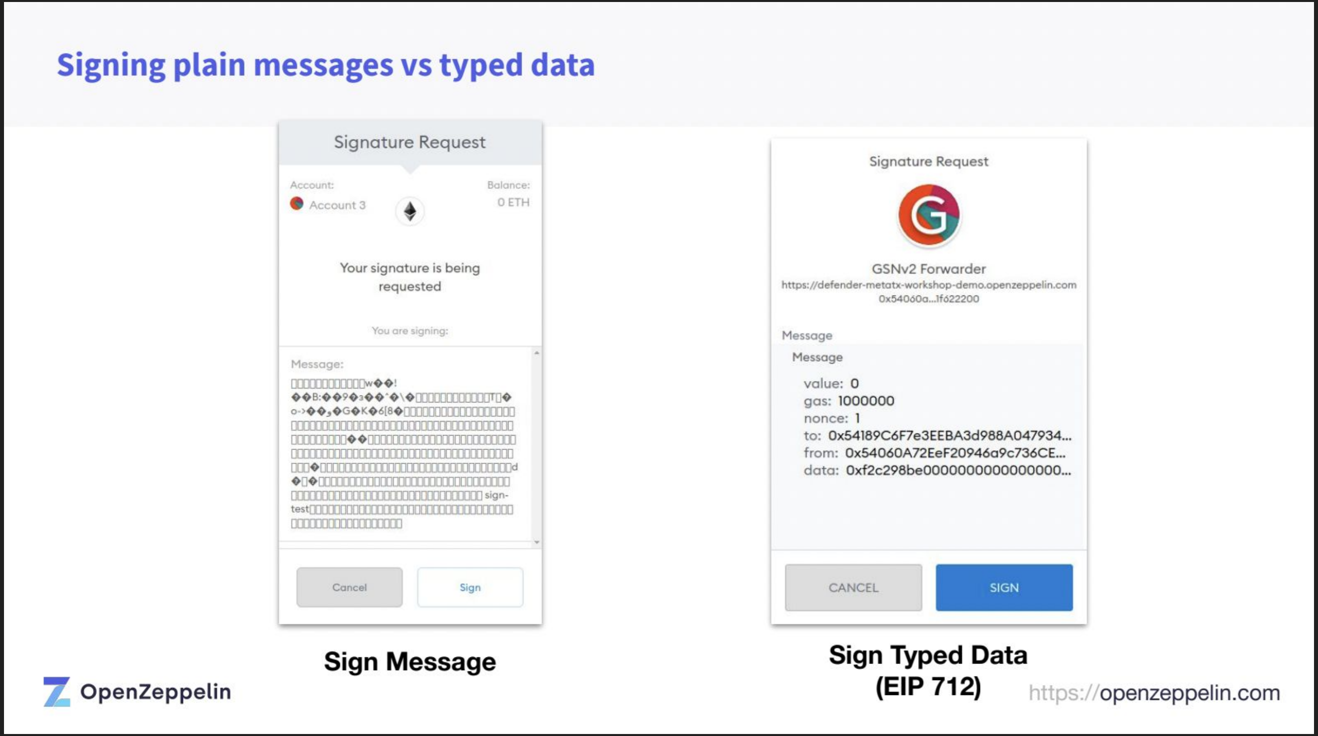

## Signing plain messages vs typed data

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```

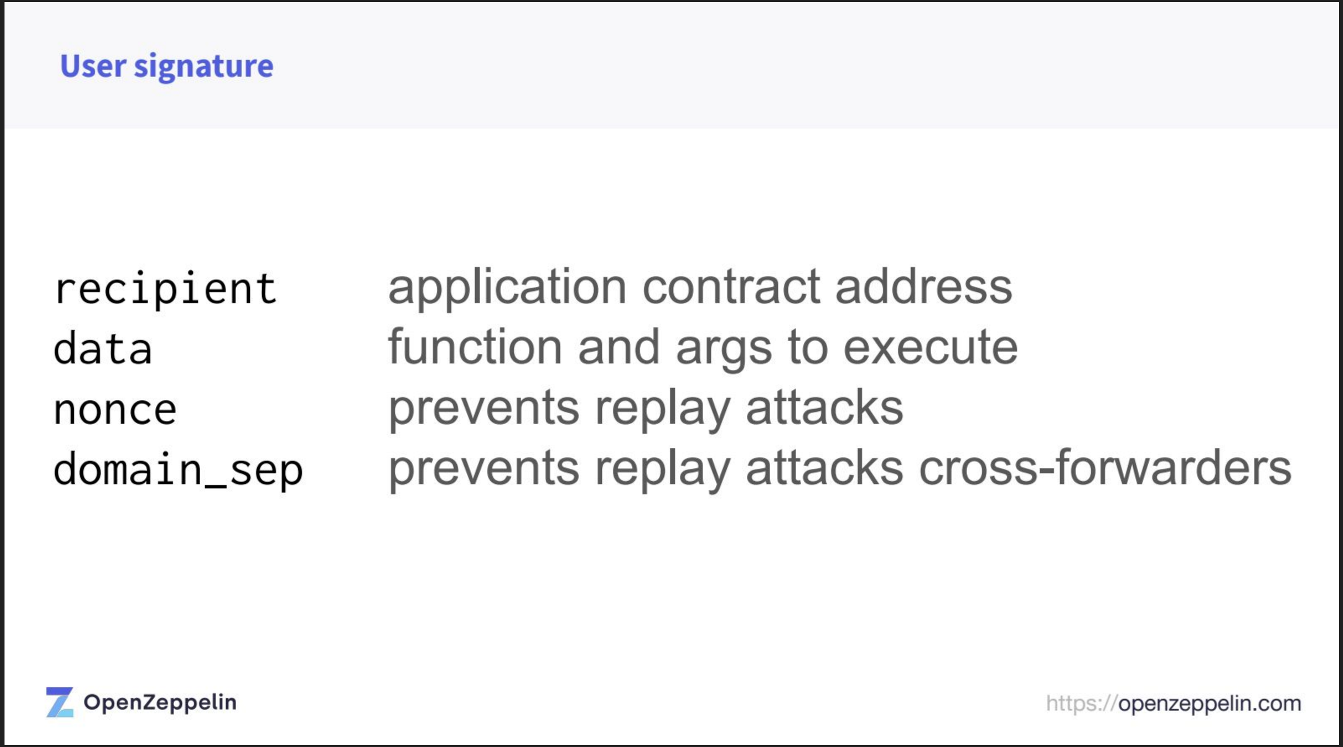
Sign Message

```
value: 0
gas: 1000000
nonce: 1
to: 0x54189C6F7e3EEBA3d988A047934...
from: 0x54060A72EeF20946a9c736CE...
data: 0xf2c298be0000000000000000...
```

Sign Typed Data (EIP 712)

OpenZeppelin https://openzeppelin.com

## Implementation  Using OpenZeppelin Contracts & Defender

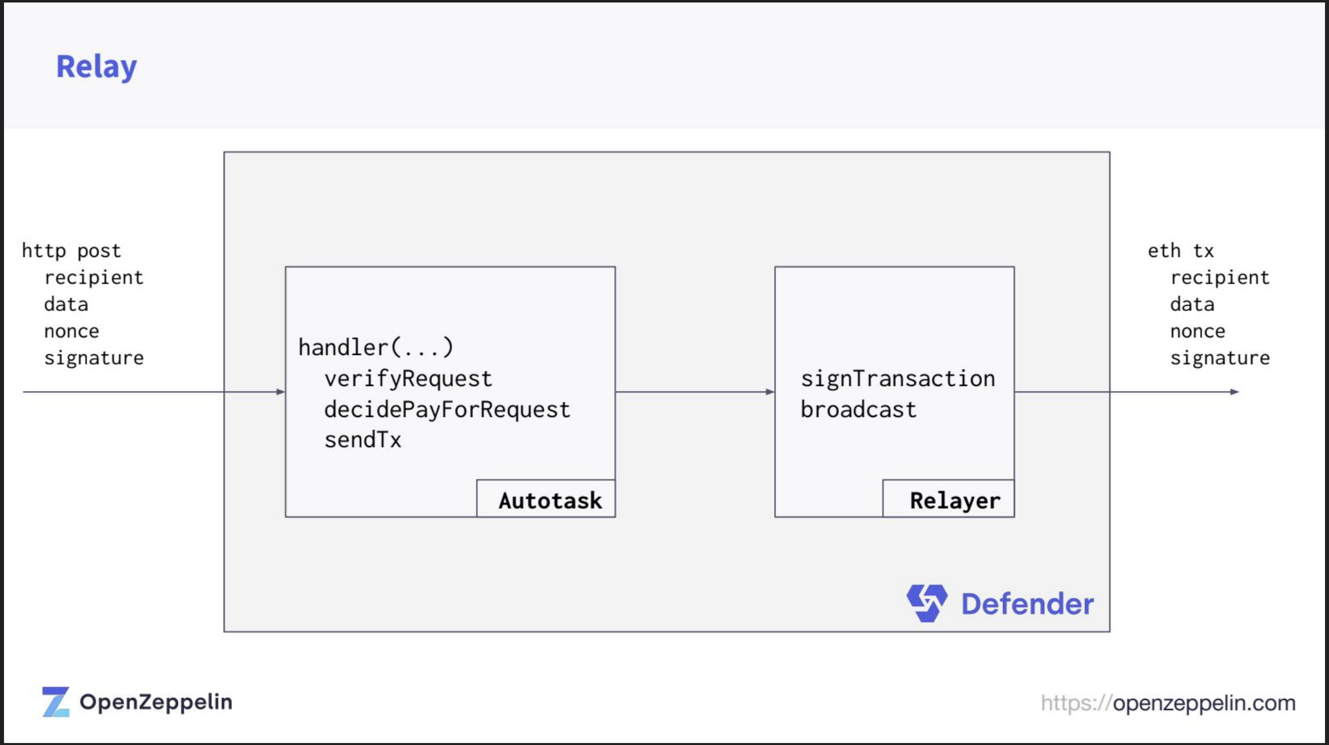


User signature

| | |
|---|---|
| `recipient` | application contract address |
| `data` | function and args to execute |
| `nonce` | prevents replay attacks |
| `domain_sep` | prevents replay attacks cross-forwarders |

OpenZeppelin https://openzeppelin.com

# Implementation  Using OpenZeppelin Contracts & Defender



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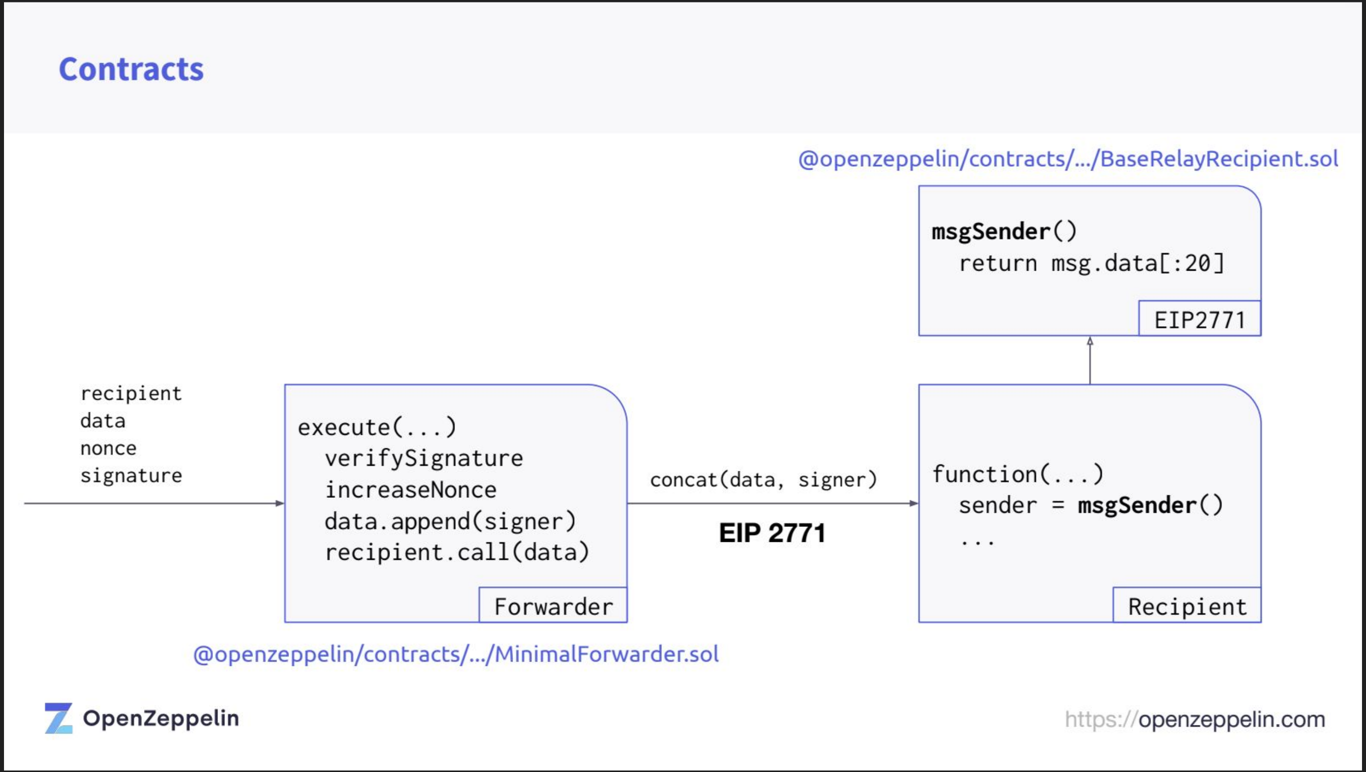

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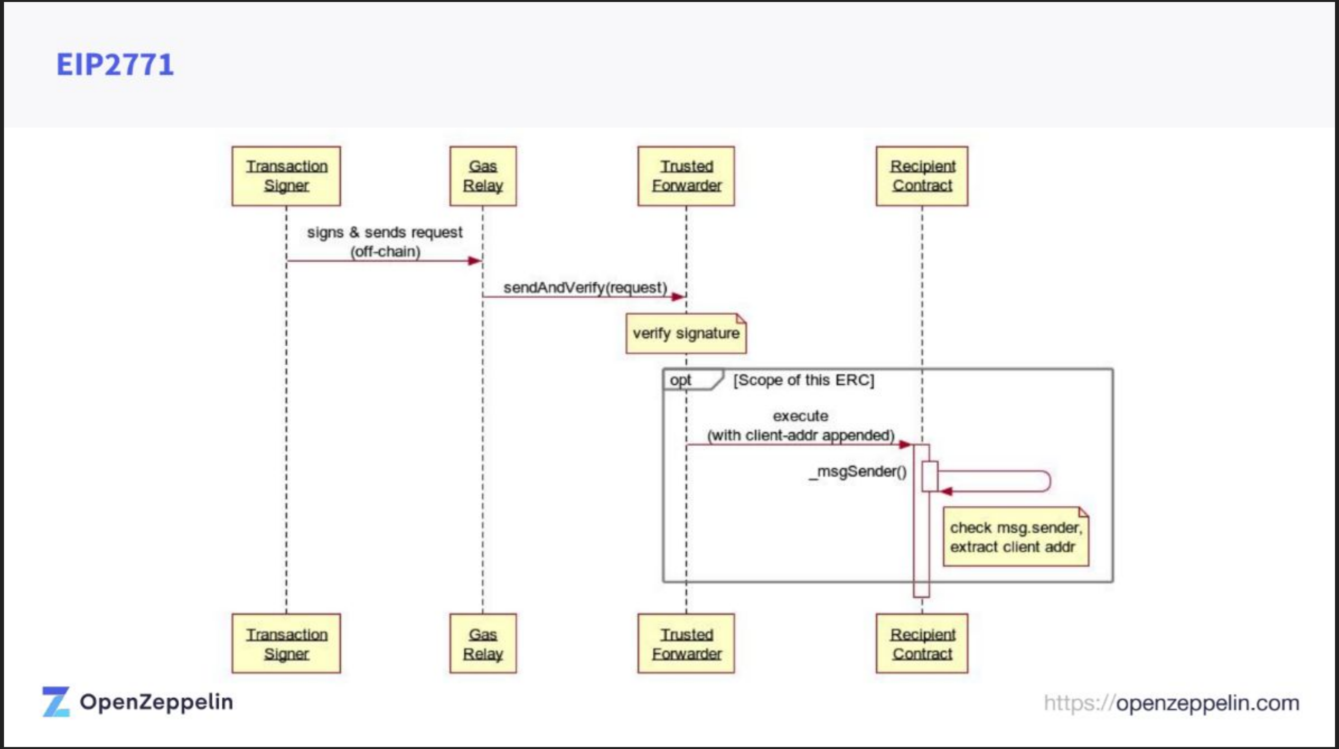

## Recap

- User signs meta-tx request and sends to webhook
- Autotask receives and validates request
- Relayer wraps request in a tx, signs it, and sends it
- Forwarder contract validates signature and forwards call
- Registry contract processes call as if sent by the signer

## Demo

Thank you.