

# IOTA Atomic Swaps

# Kinds

1. Between colored tokens
2. Between ERC20 on a single SC chain
3. Between ERC20 on different SC chains
4. Between ERC20 on different blockchains
5. Between tokens on different blockchains

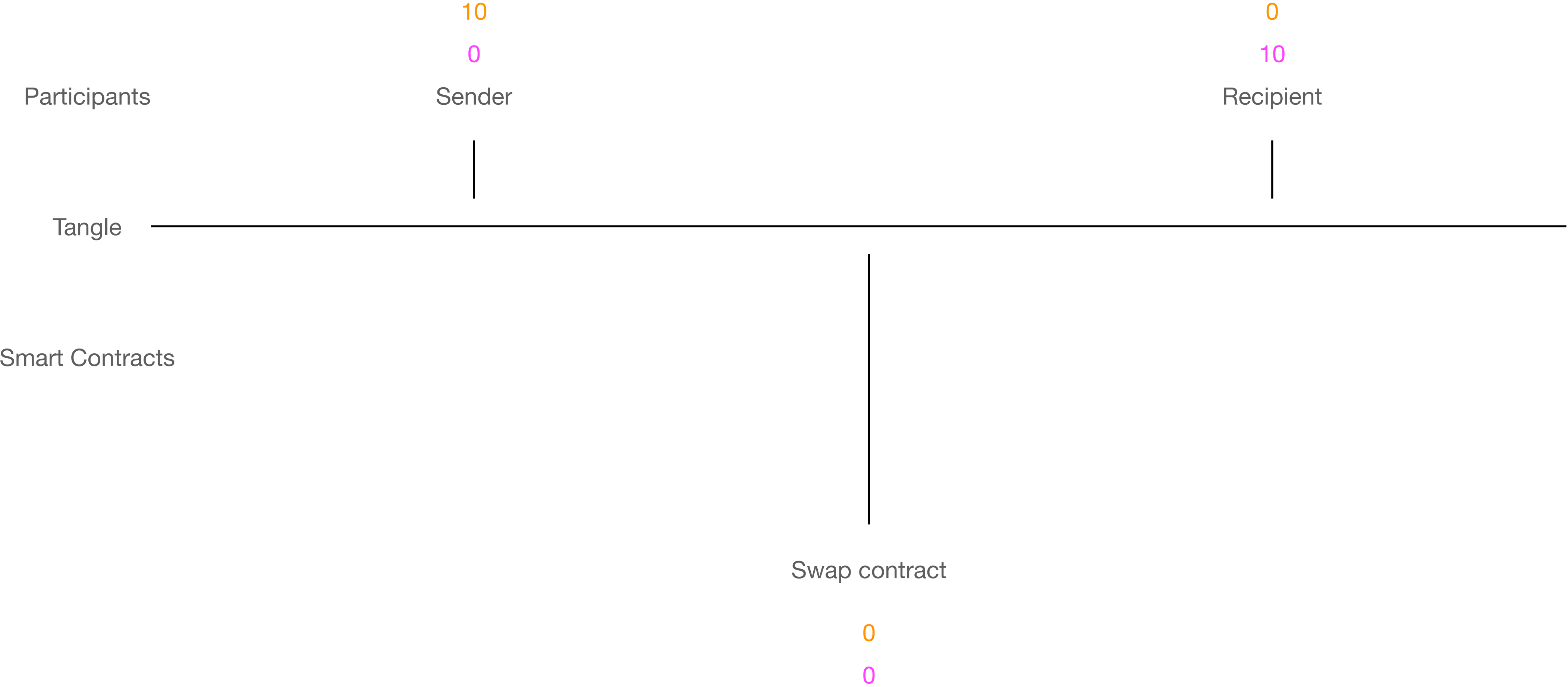
# 1. Between colored tokens

## L1 Tangle built in

- Native support by the Tangle
- Colored balances can be transferred synchronously

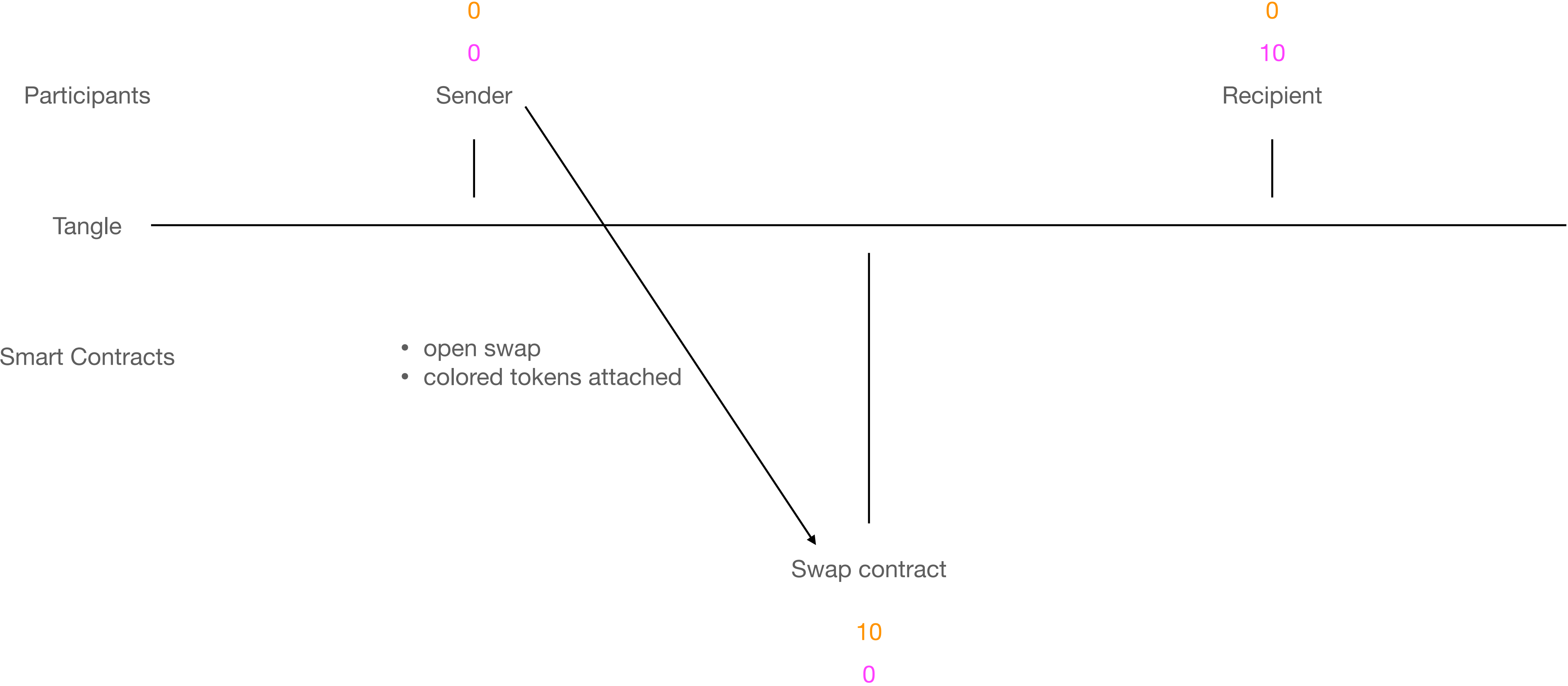
# 1. Between colored tokens

## L1 Tangle built in



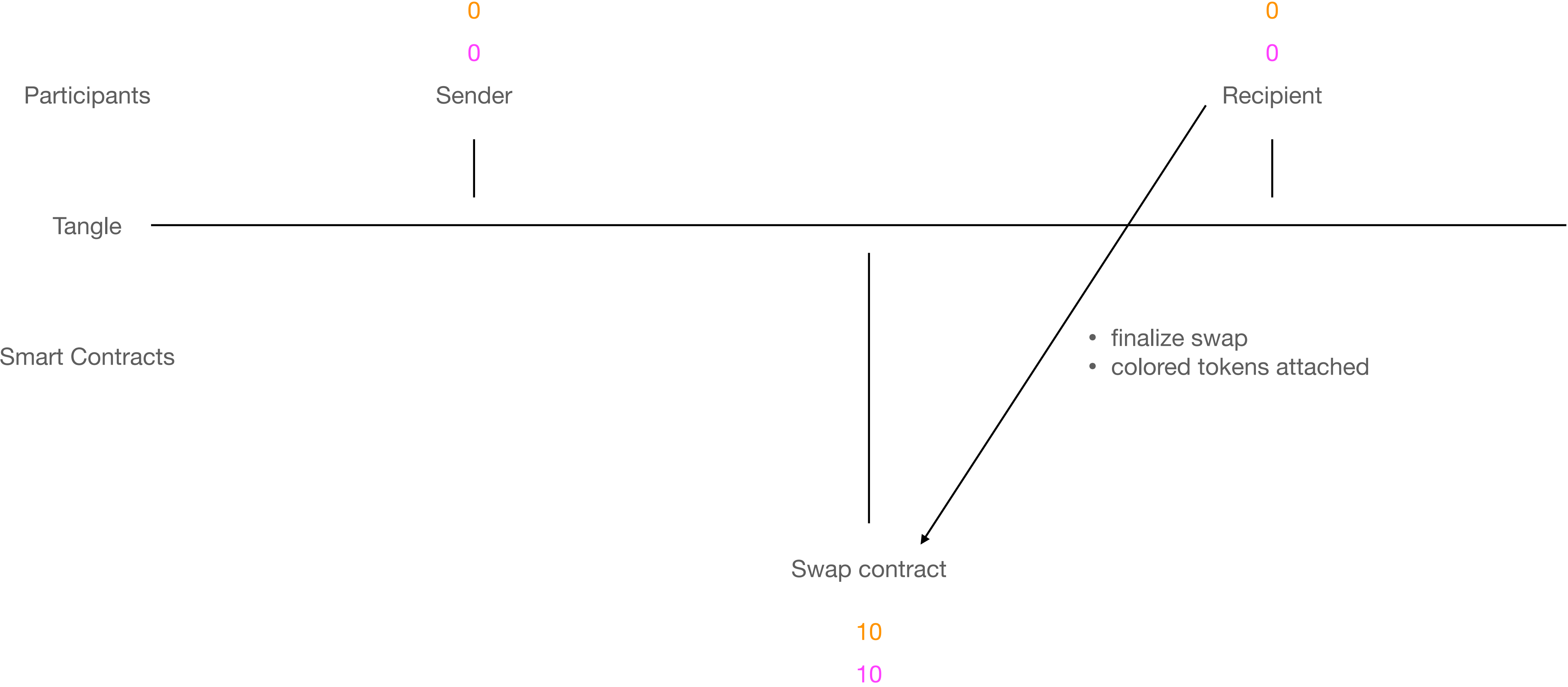
# 1. Between colored tokens

## L1 Tangle built in



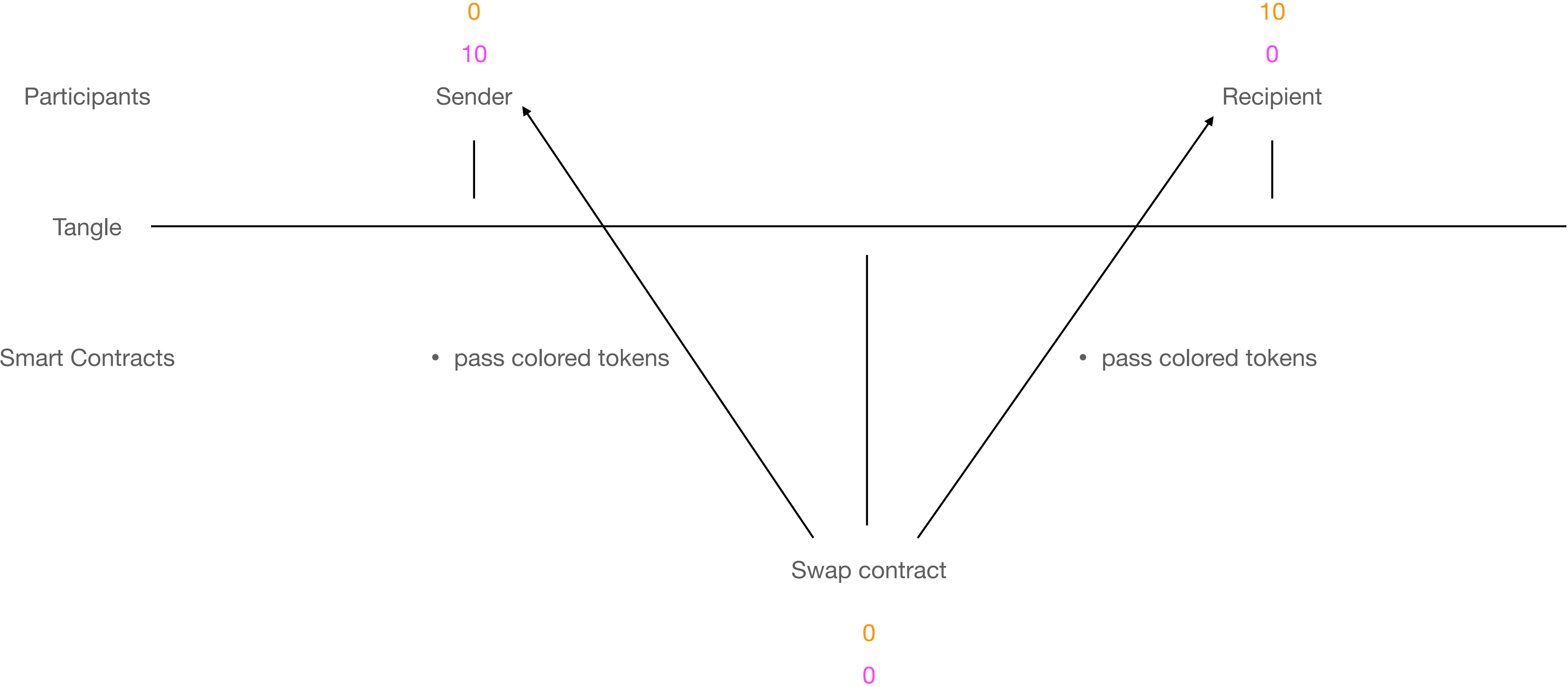
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## L1 Tangle built in




# 1. Between colored tokens

## L1 Tangle built in



## 2. Between ERC20 on a single SC chain

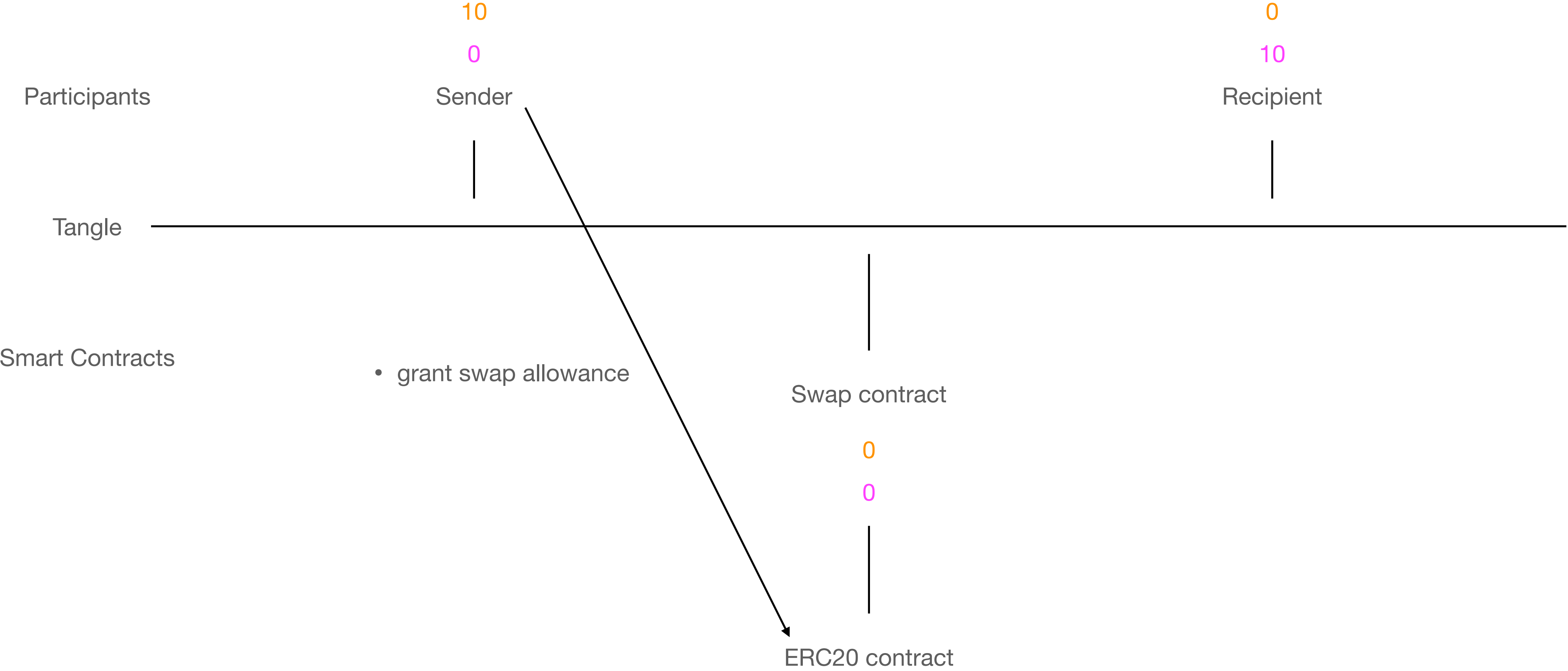
### Synchronous calls

- Same chain  Synchronous calls
- Both ERC20 SC and swap contract on same chain
- ERC20 balances are atomically transferred step by step



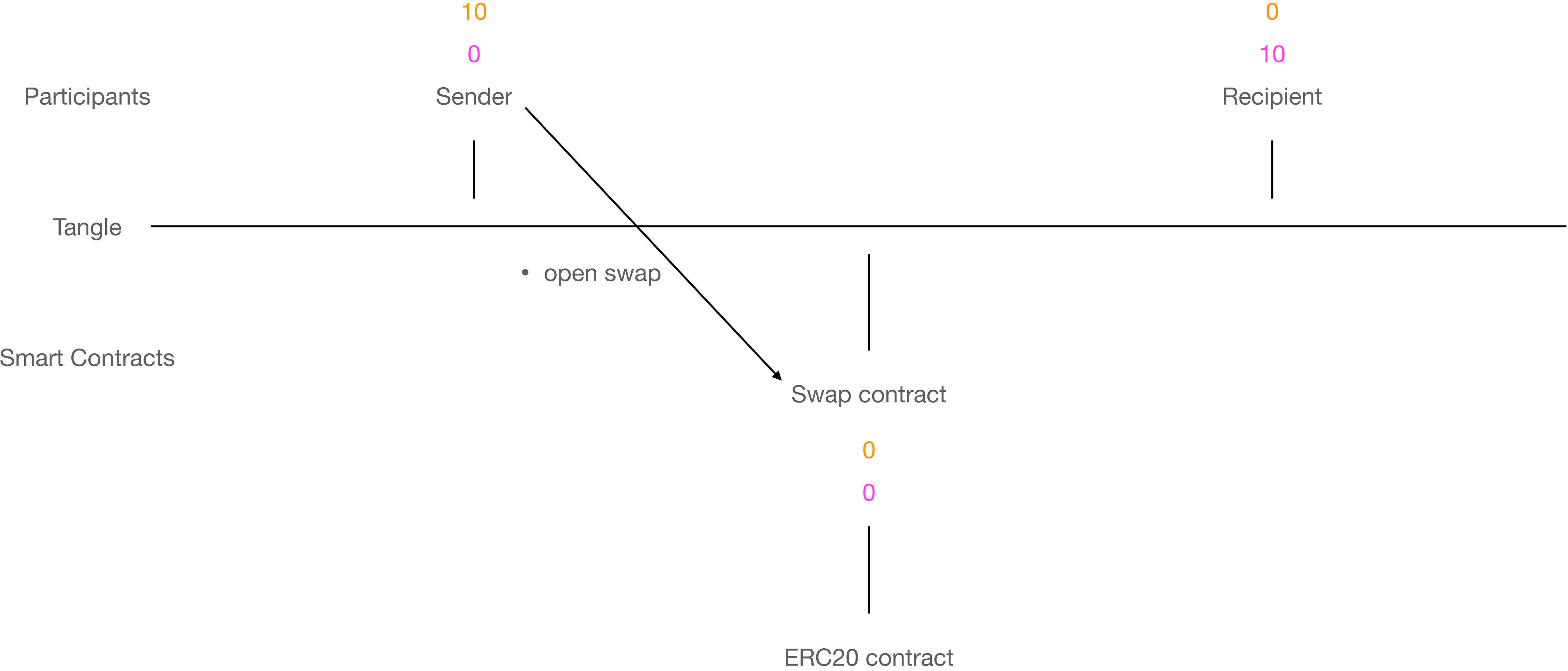
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## Synchronous calls



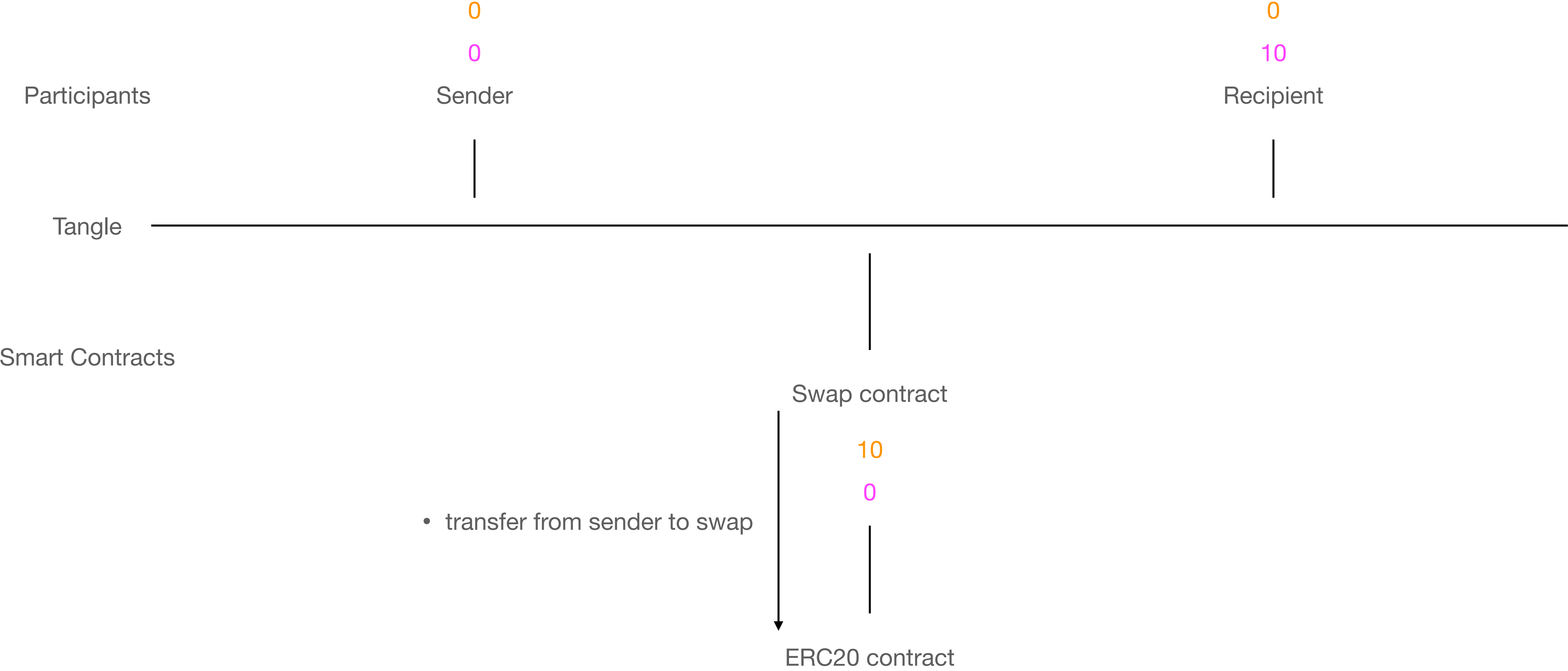
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## Synchronous calls



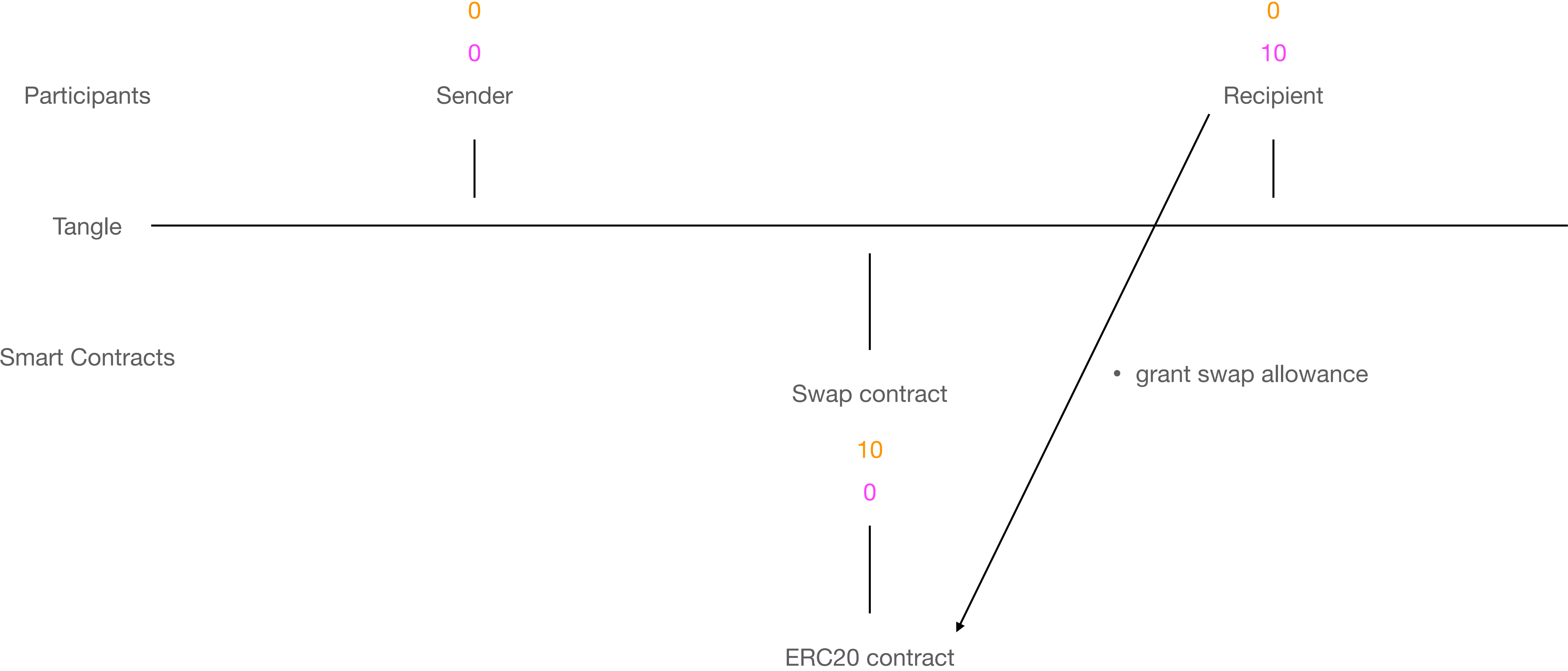
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## Synchronous calls



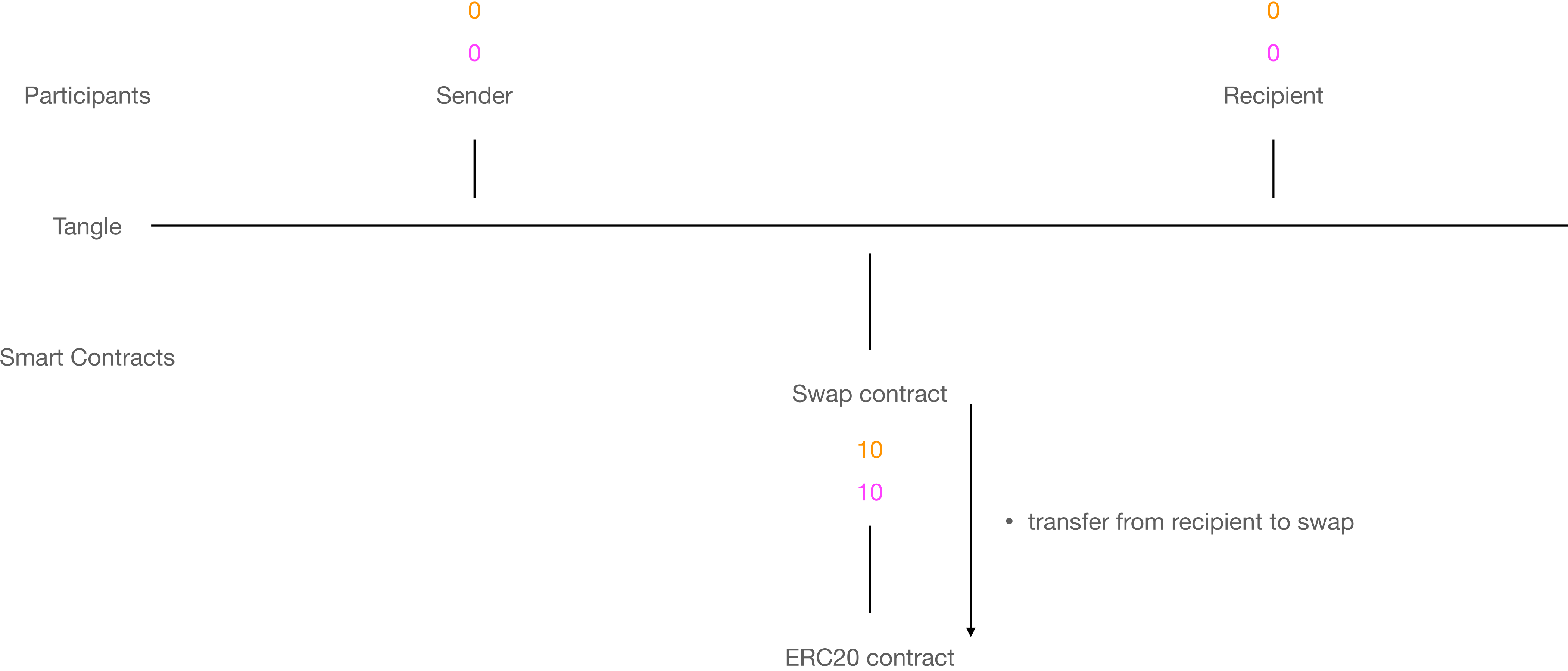
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## Synchronous calls



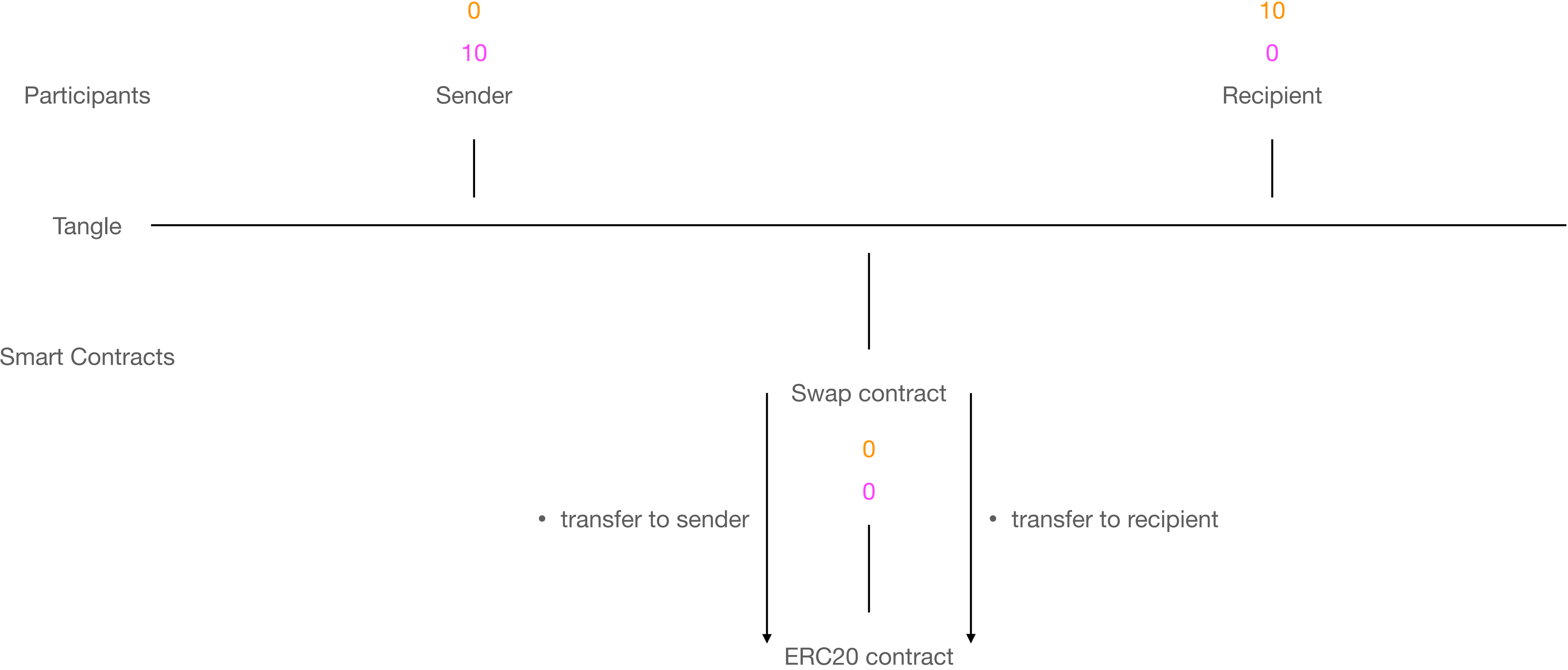
# 2. Between ERC20 on a single SC chain

## Synchronous calls



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## Synchronous calls



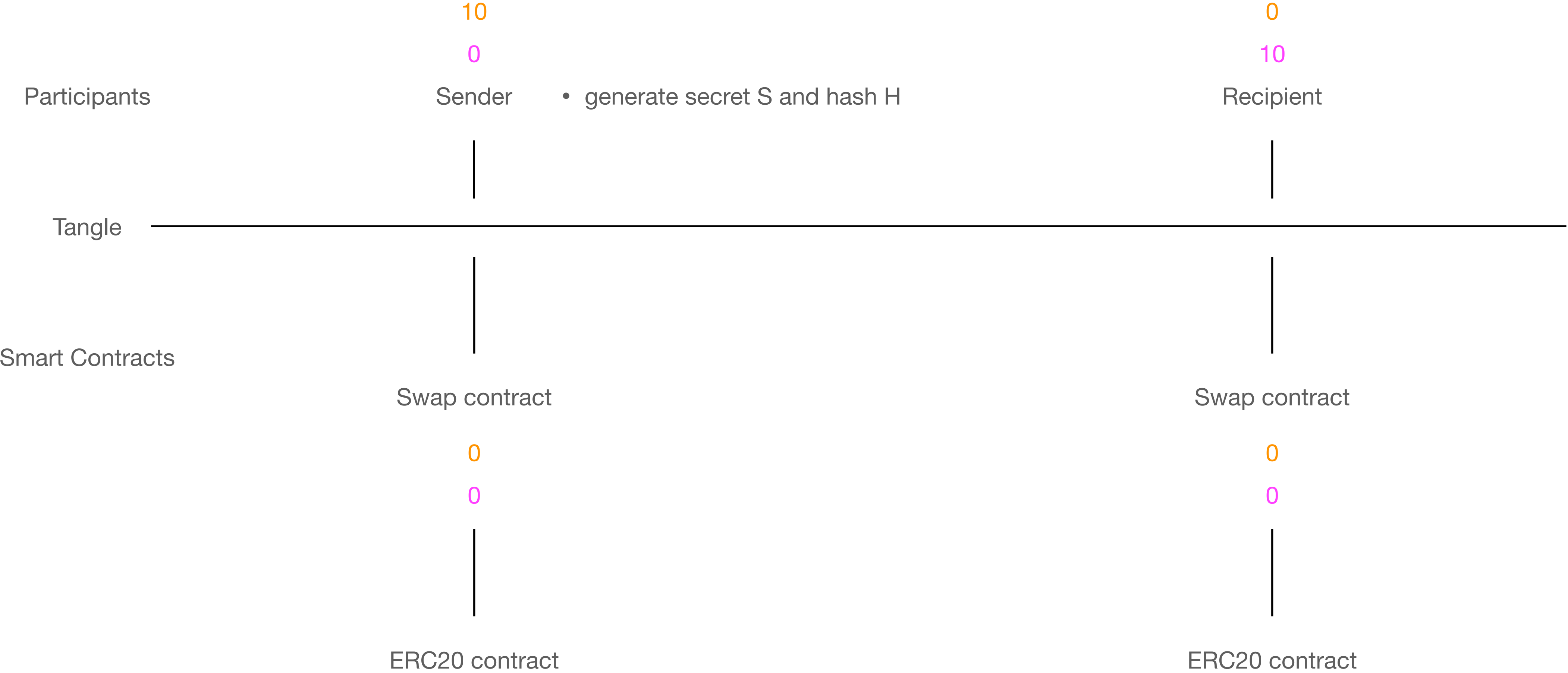
# 3. Between ERC20 on different SC chains

## Multiple swap contracts

- Async posting solution is very complicated
- Introduction of secrets
- Add additional swap contract on every ERC20 chain
- Locking by secrets and timestamps
- Offchain secret „monitoring“ for **Wasp**

# 3. Between ERC20 on different SC chains

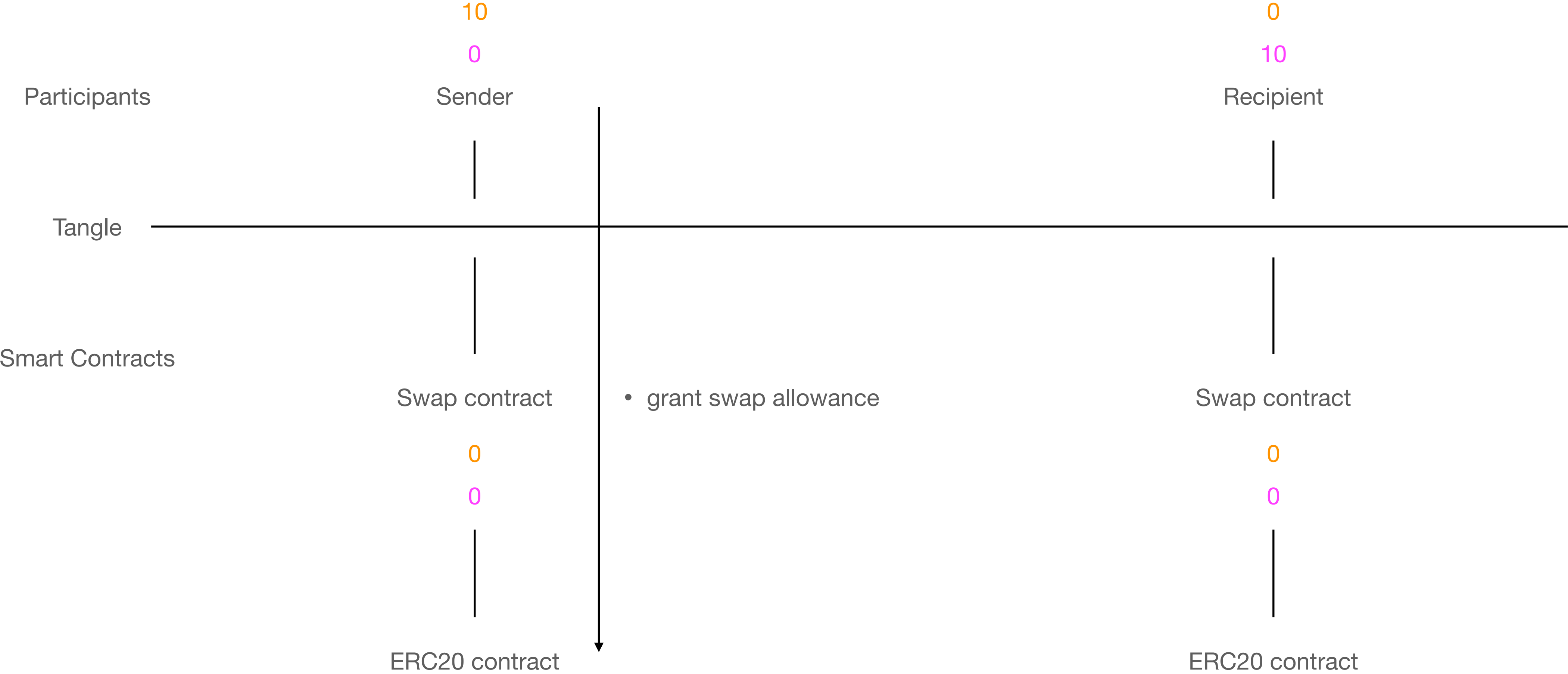
## Multiple swap contracts





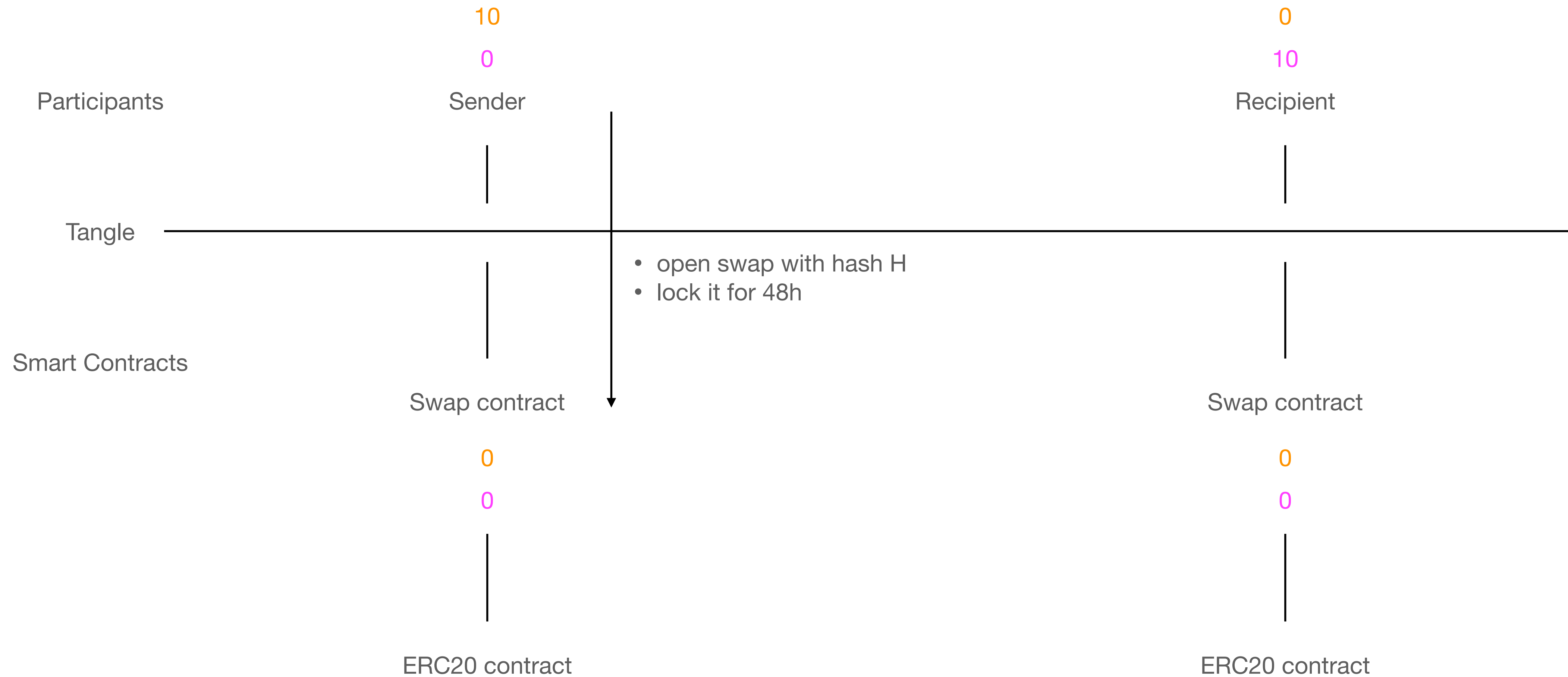
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## Multiple swap contracts



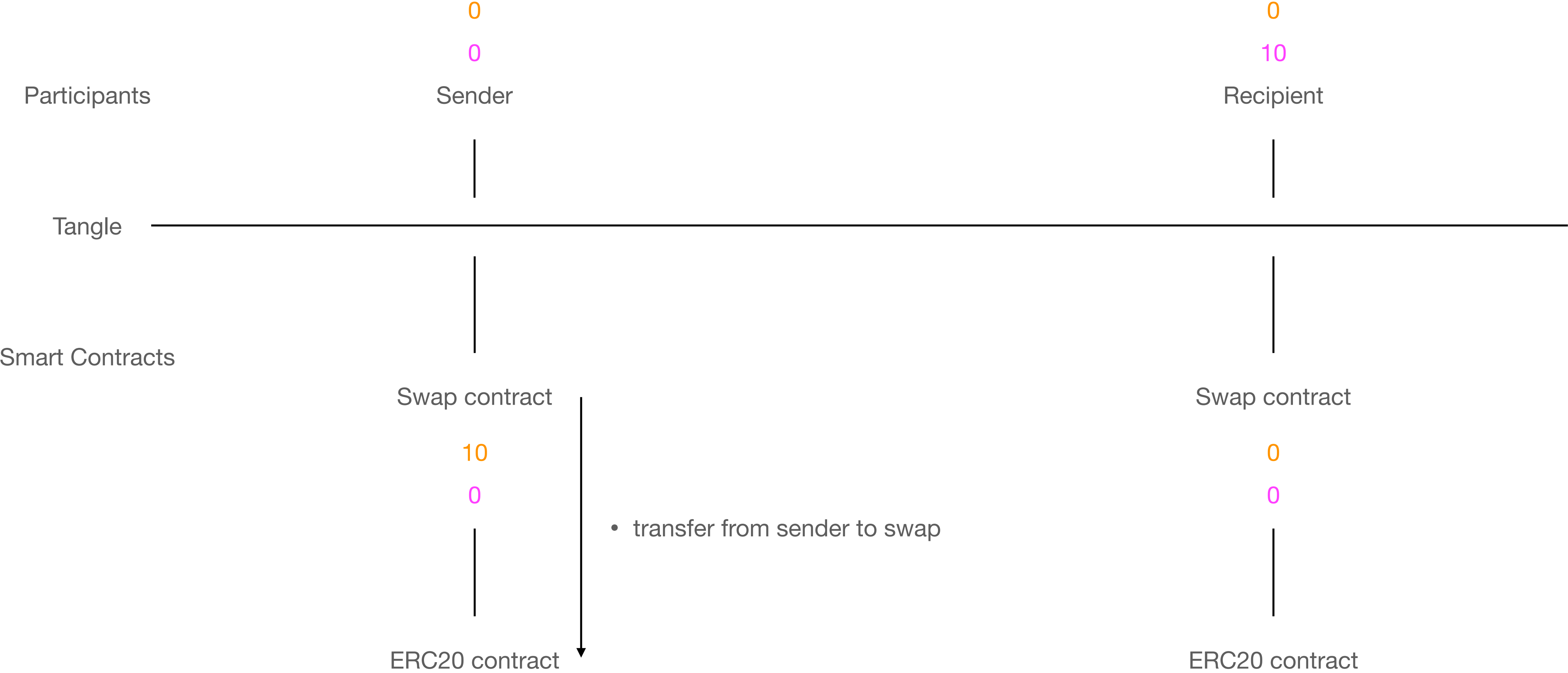
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## Multiple swap contracts



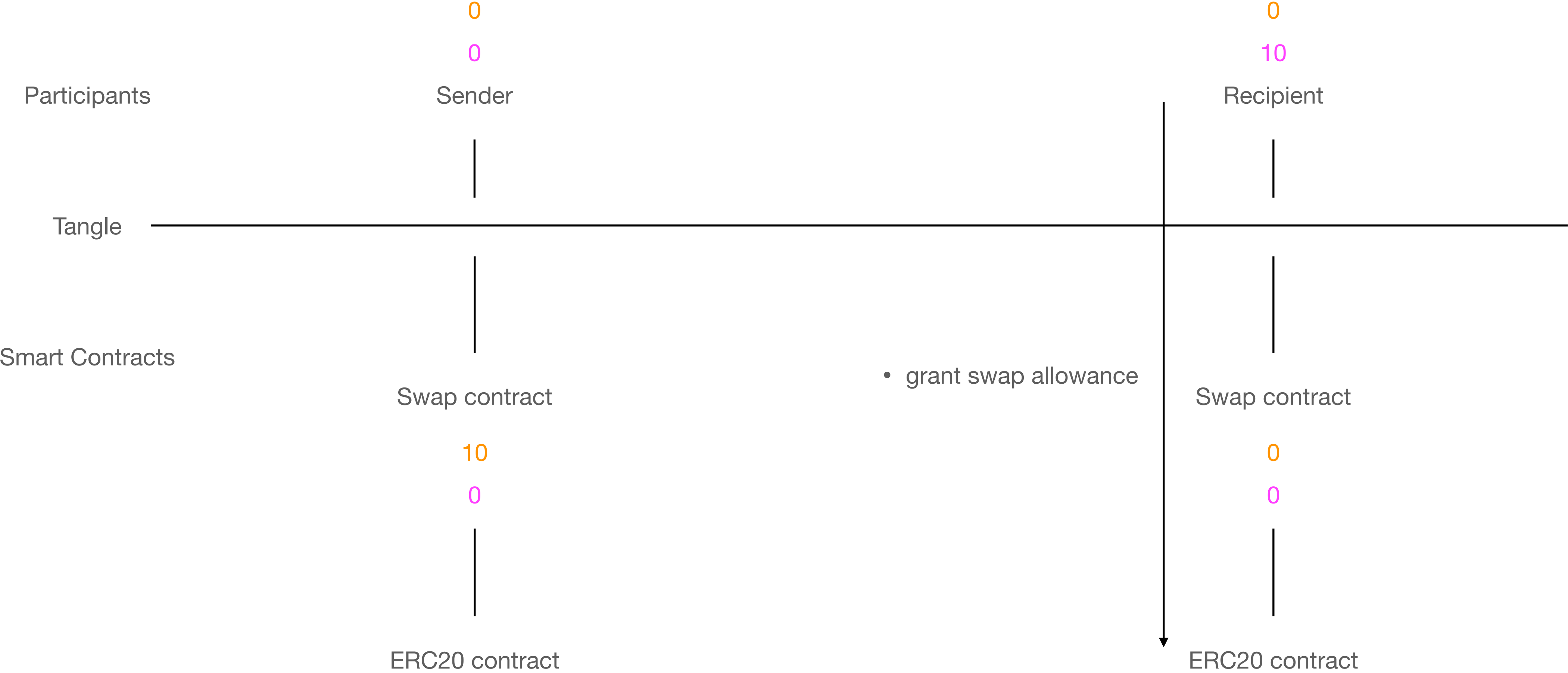
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## Multiple swap contracts



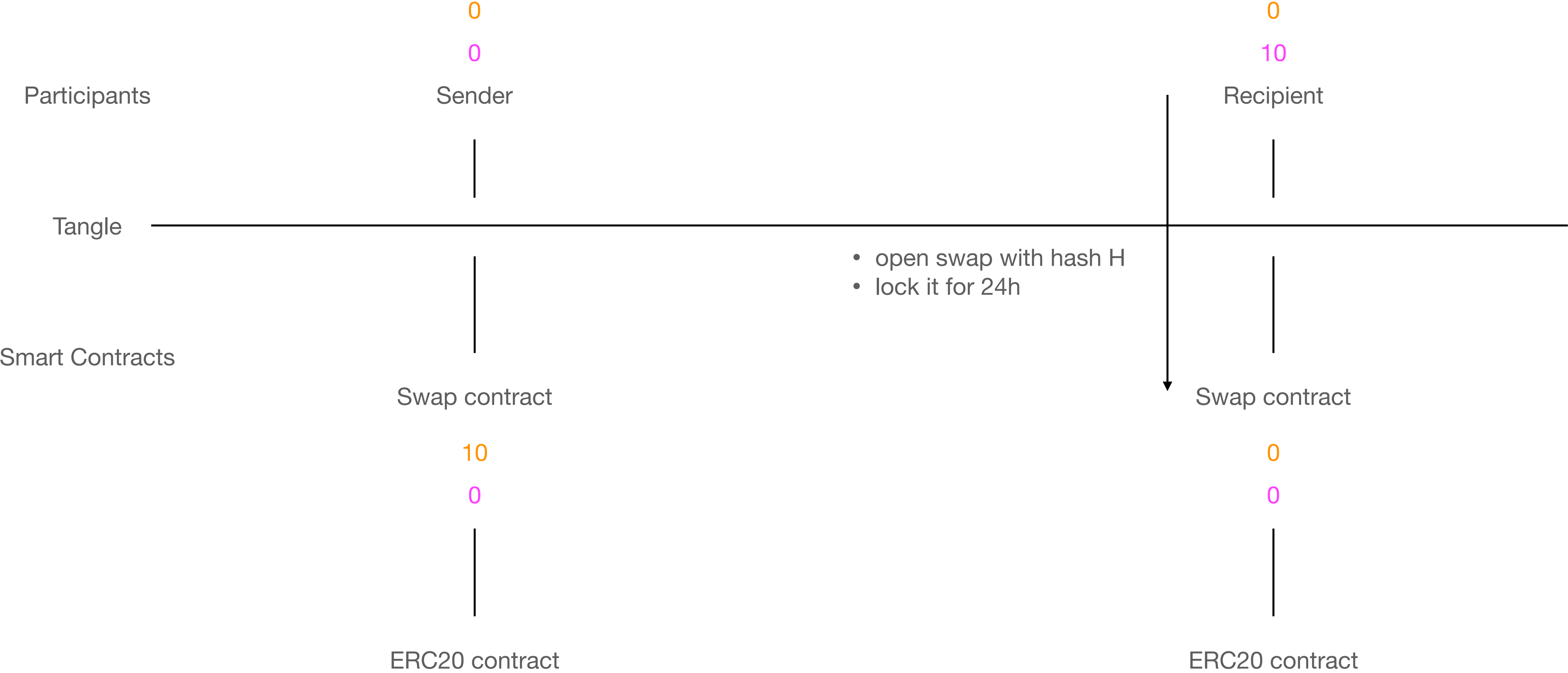
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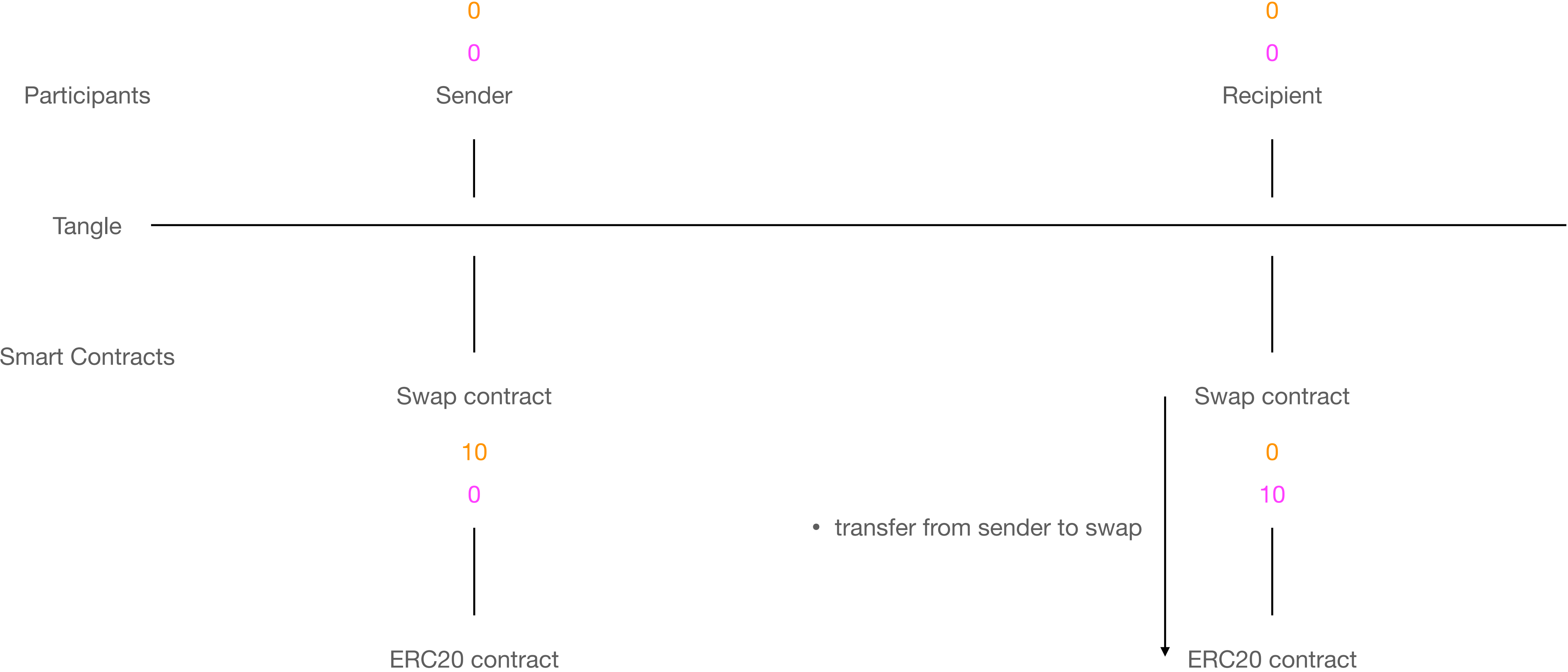
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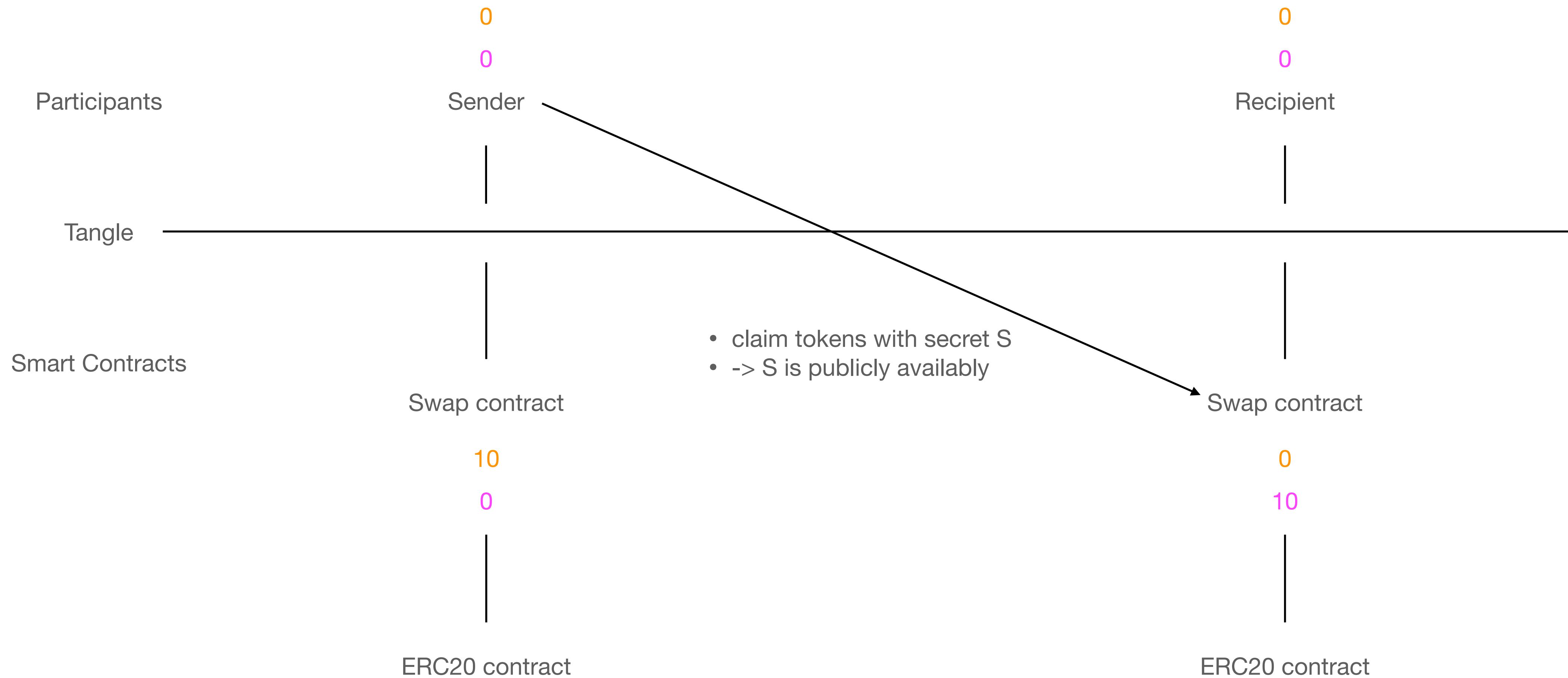
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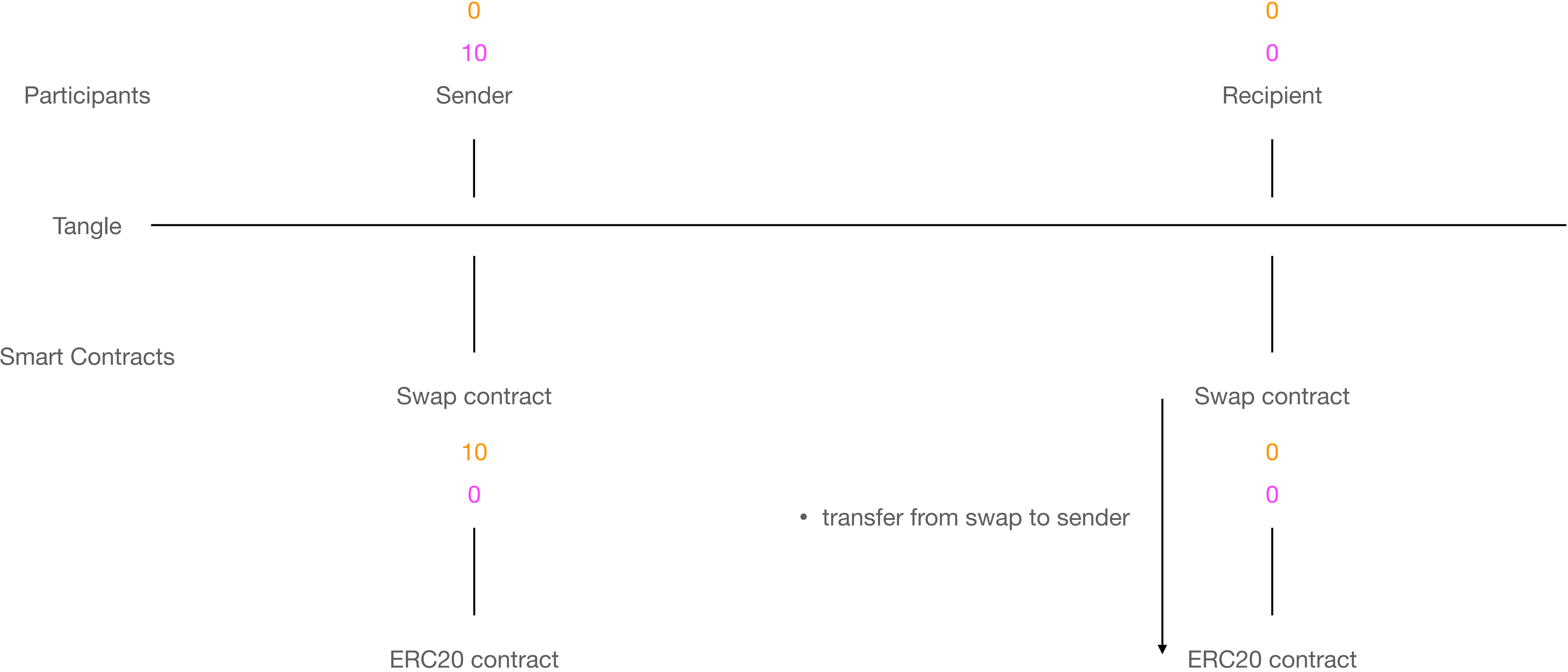
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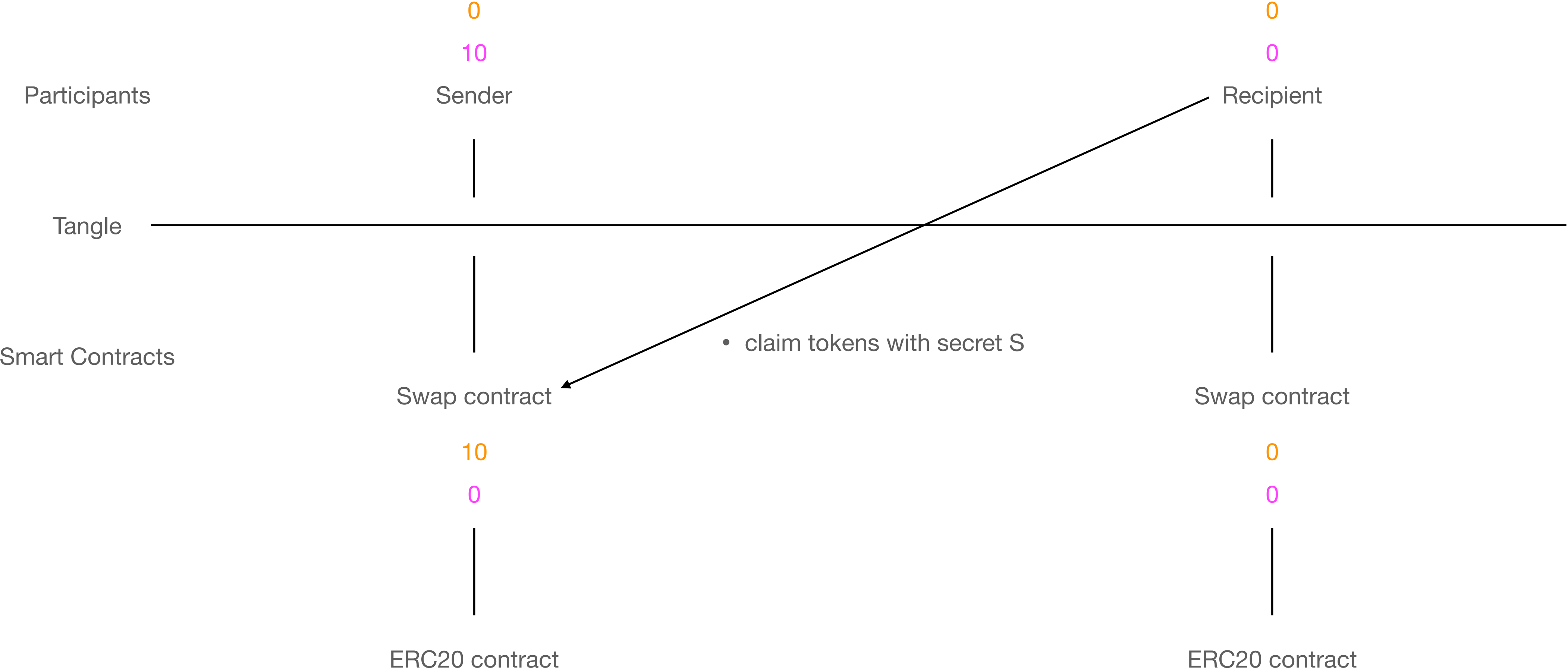
## Multiple swap contracts





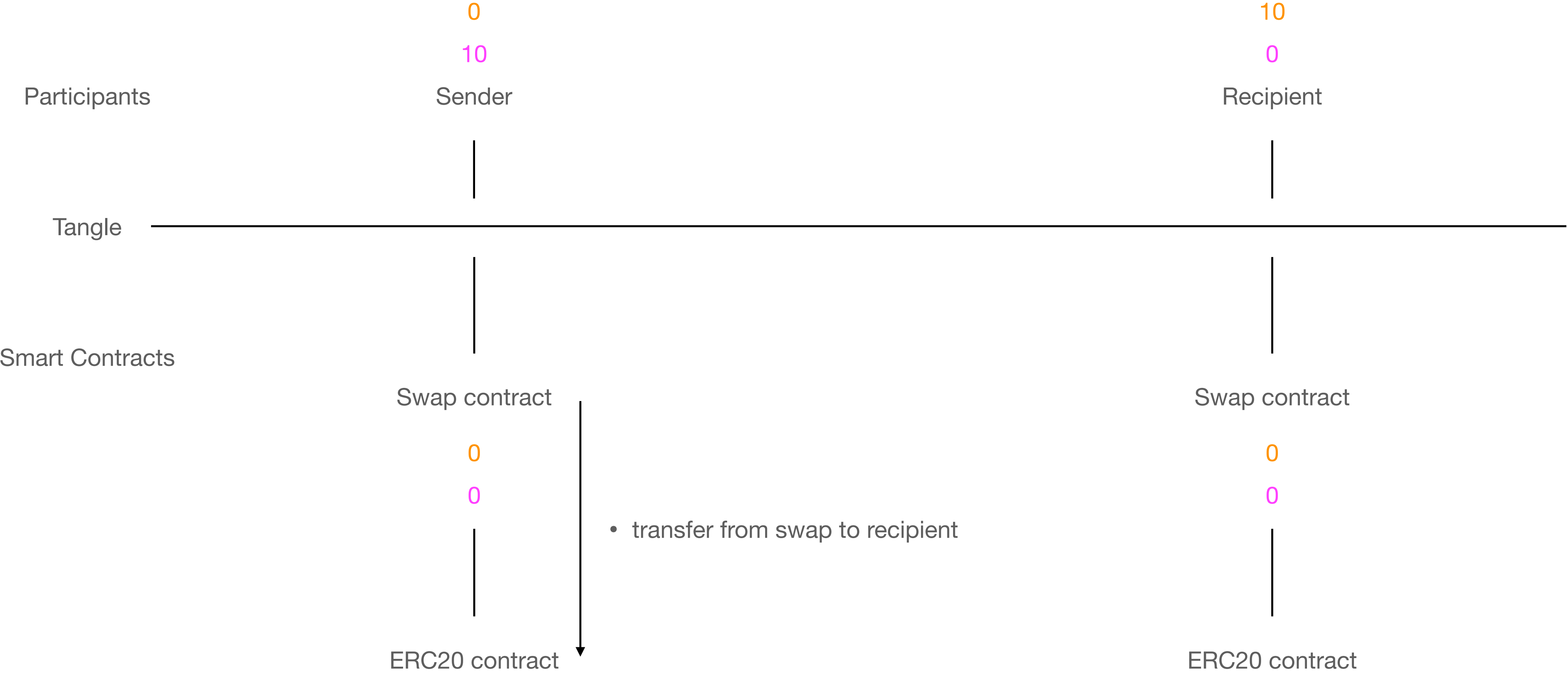
# 3. Between ERC20 on different SC chains

## Multiple swap contracts



# 3. Between ERC20 on different SC chains

## Multiple swap contracts



# 4. Between ERC20 on different blockchains

Same as multi chain swap without Tangle

- No connection
- Offchain secret „monitoring“ for **every blockchain**

# 5. Between tokens on different blockchains

## HTLC

- Introduction of secrets
- Additional swap contract if possible
- At least HTLC or similar functionality necessary

# Prototypes

## Progress

- ✓ 1. Between colored tokens
- ✓ 2. Between ERC20 on a single SC chain
- ✓ 3. Between ERC20 on a different SC chains
- ? 4. Between ERC20 on different blockchains
- ? 5. Between tokens on different blockchains

# Next steps

## Relay

1. Between two SC chains
  - BLS validation in SC
  - e.g. permissioned and permissionless
2. Between IOTA and other blockchains
  - consensus validation on both sides
  - mostly uni directional

**End**