

NEAR-IBC

-- An IBC implementation on NEAR protocol

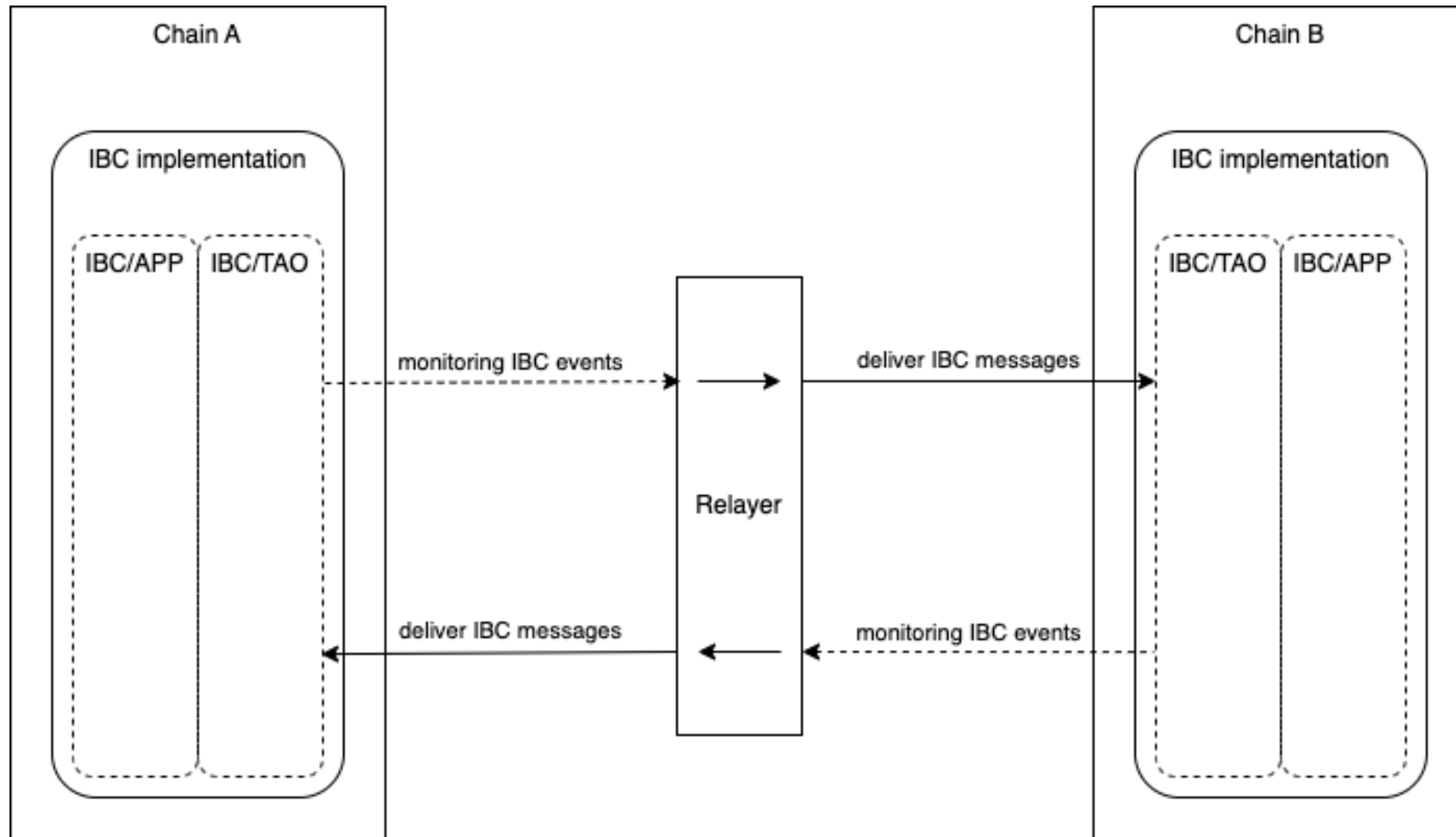
Rivers @ Octopus Network, June 2023



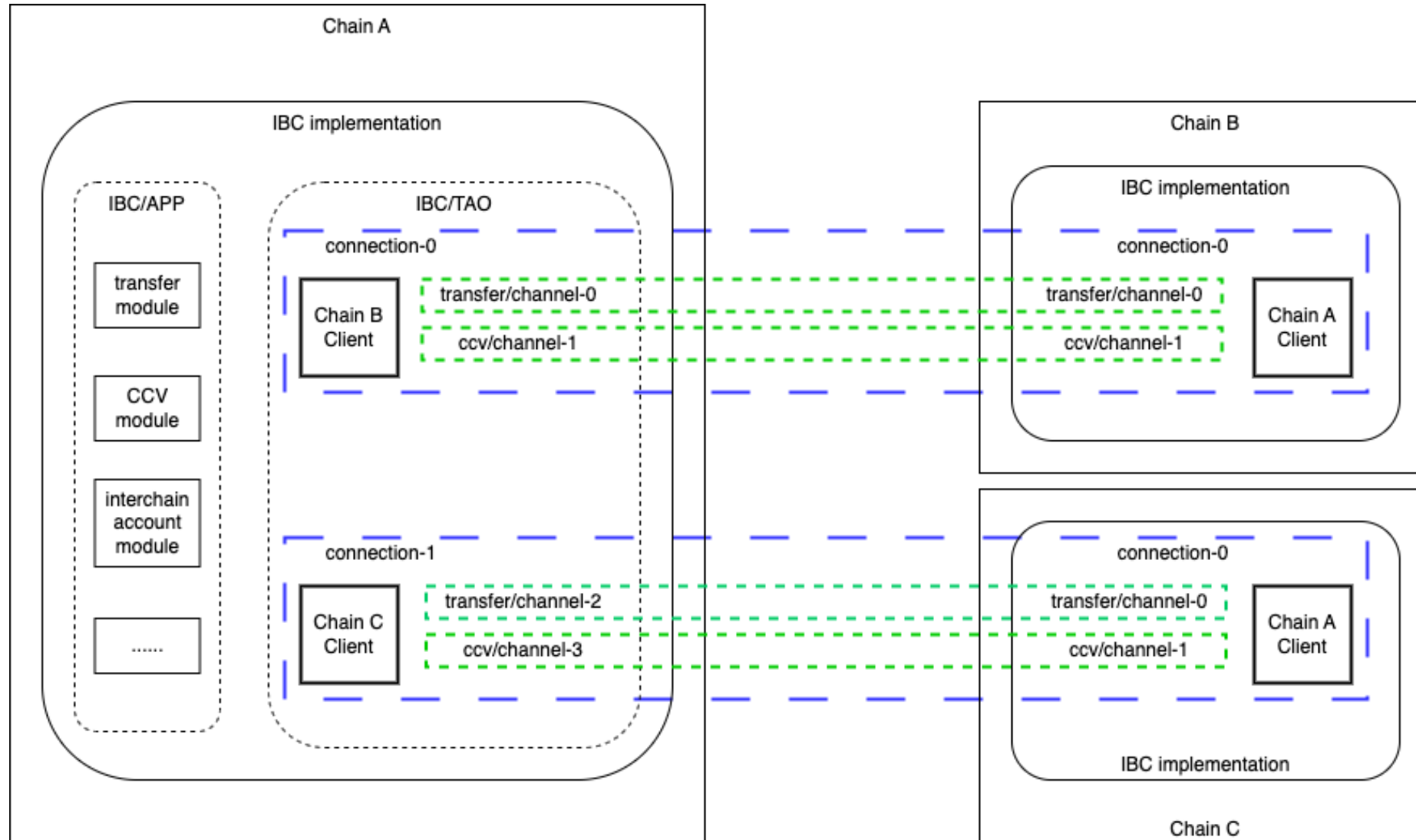
Outline

- IBC protocol introduction
- IBC/TAO (client, connection and channel)
- IBC message in IBC/TAO
- ICS20 and its use cases
- Challenges in implementing IBC protocol on smart contract platform
- NEAR-IBC solution
- Further thoughts

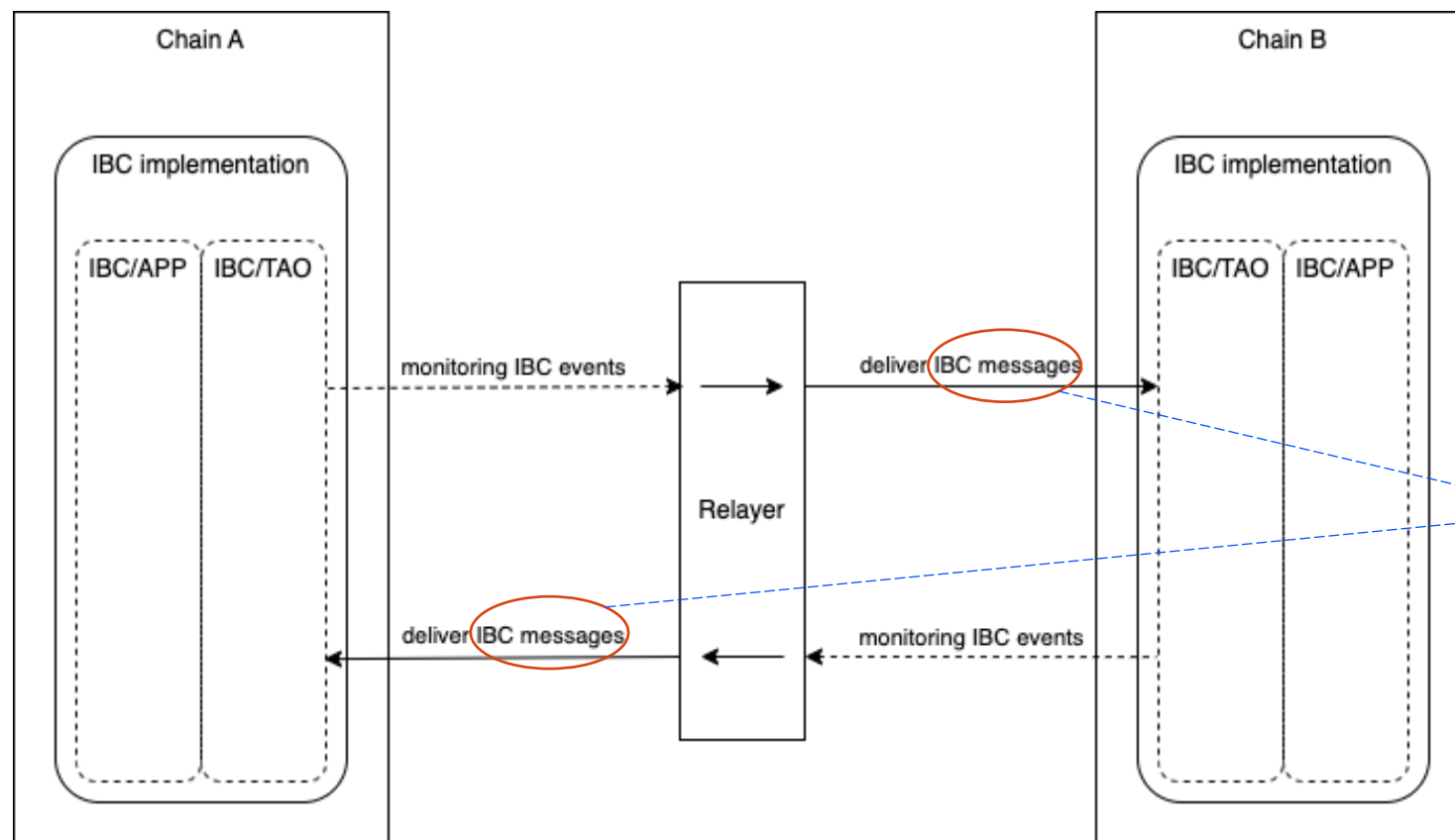
IBC protocol introduction



IBC/TAO (client, connection and channel)



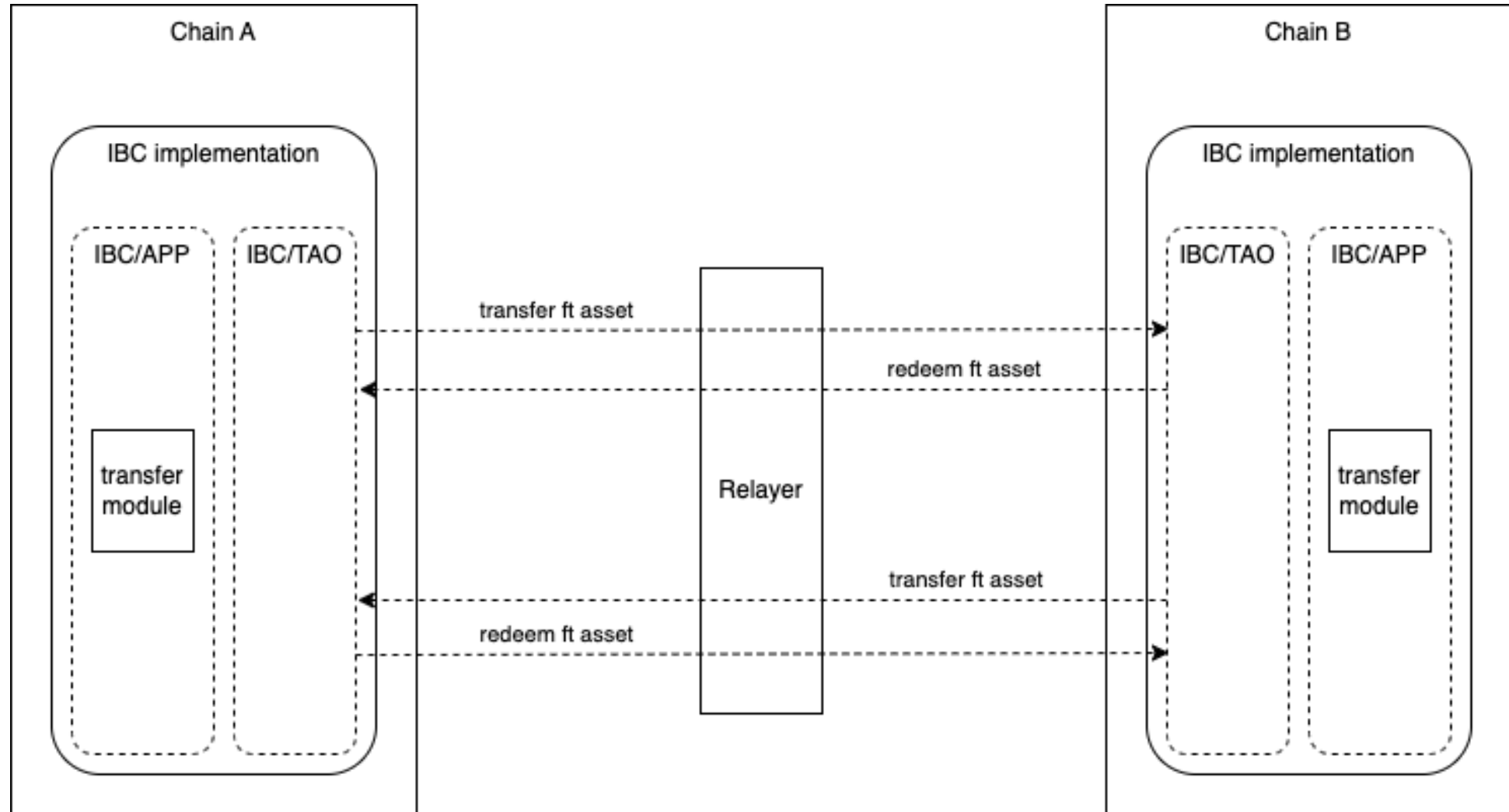
IBC message in IBC/TAO



IBC message

- Client message
- Connection message
- Channel message
- Packet message

ICS20 and its use cases



Challenges in implementing IBC protocol on smart contract platform

	Technical challenges	Use cases in IBC protocol
1	Gas limitation	Signature verification for validators, possible complex computation in IBC/APP modules
2	On-chain asset management	Fungible token transfer, NFT transfer
3	Sandbox limitation	Host consensus state, host height
4	On-chain storage differences	Specific on-chain storage key rules, on-chain storage proof generation and verification

NEAR-IBC

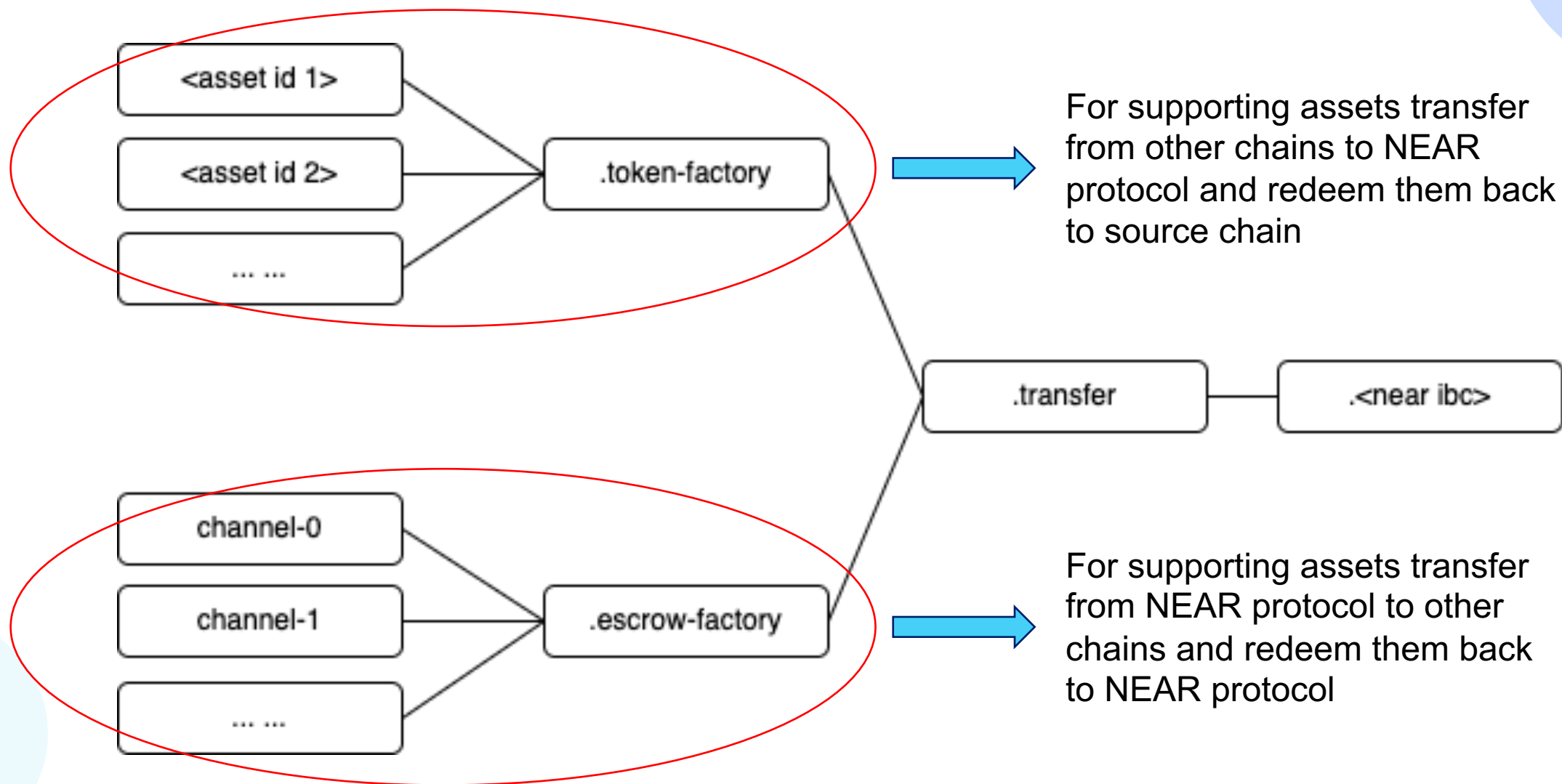
An IBC implementation on NEAR protocol.

Github: <https://github.com/octopus-network/near-ibc>

Versions:

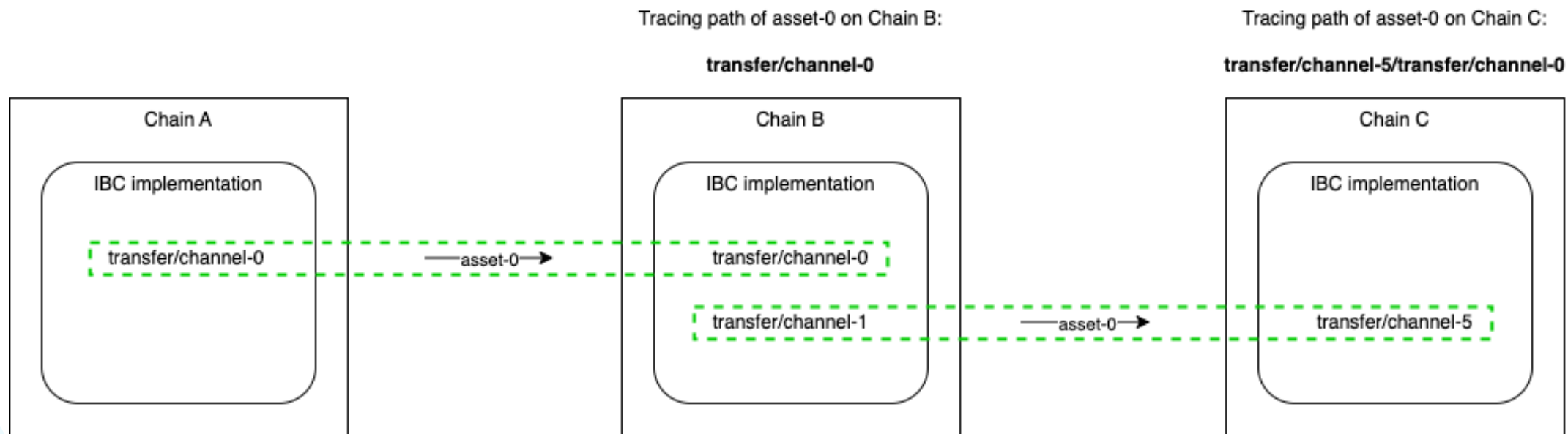
- v1.0.0-pre.1: Completed. In auditing by Blocksec.
 - IBC/TAO implemented
 - all of 4 use cases of ICS20 supported
 - based on ibc-rs v0.28
- v1.0.0-pre.2: In developing.
 - upgrade ibc-rs to v0.41
 - add solomachine client (for supporting Octopus VP solution)
 - refactor storage key generation by following IBC path rules

NEAR-IBC solution



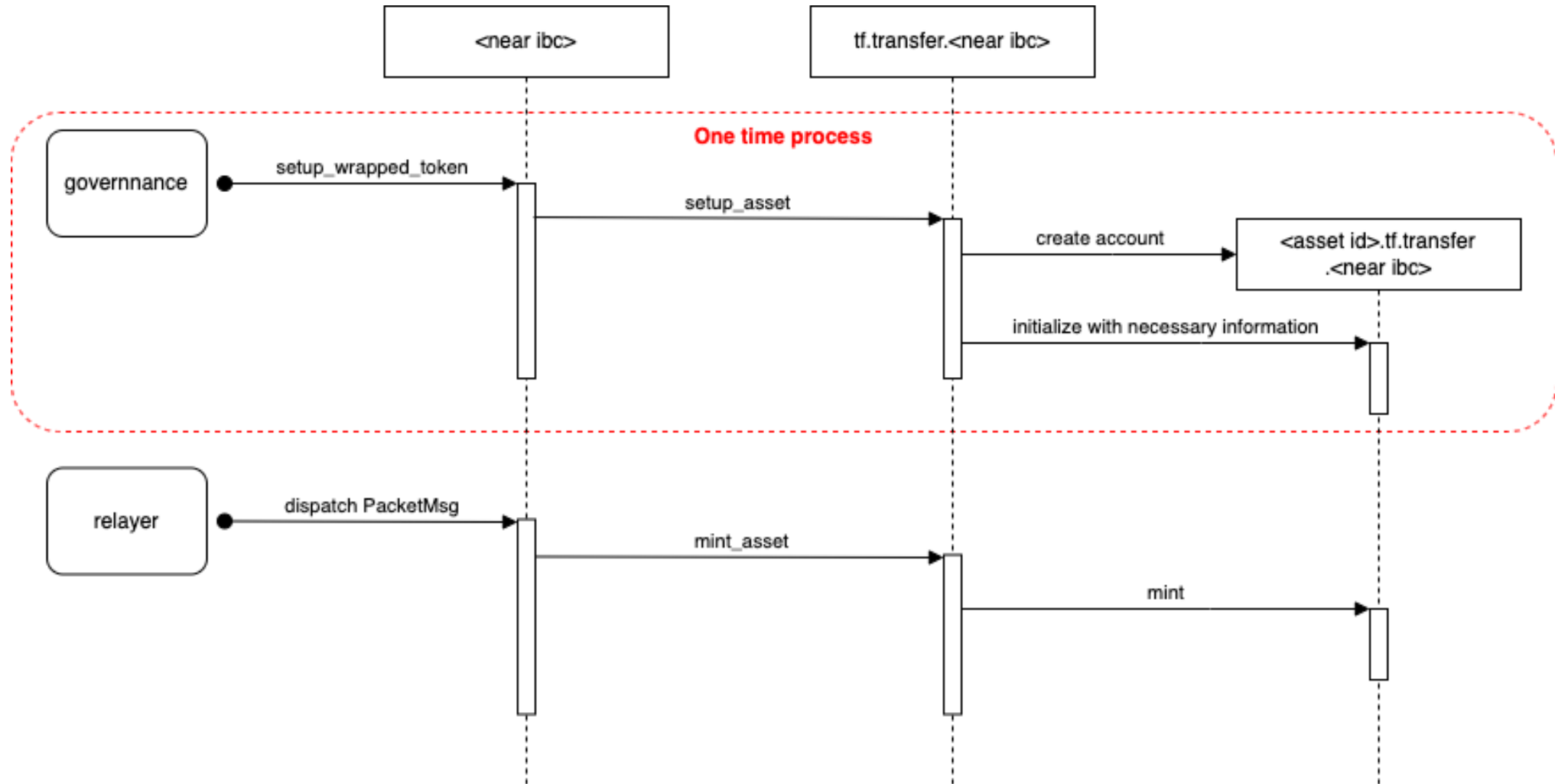
NEAR-IBC solution

The **`asset id`** in NEAR-IBC is calculated from **`tracing path`** of a certain cross-chain asset in IBC protocol.



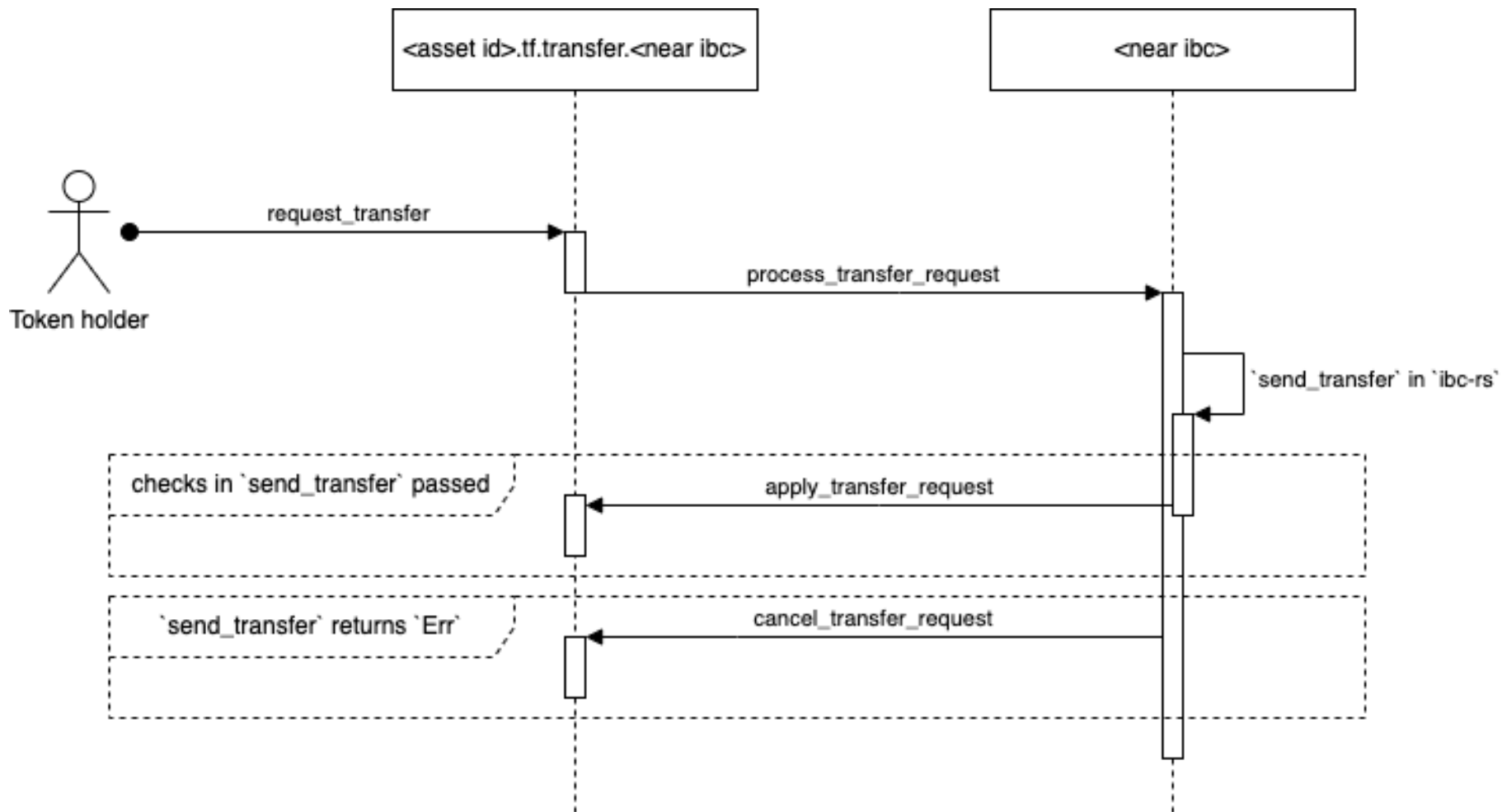
NEAR-IBC solution

Transfer asset from other chain to NEAR protocol:



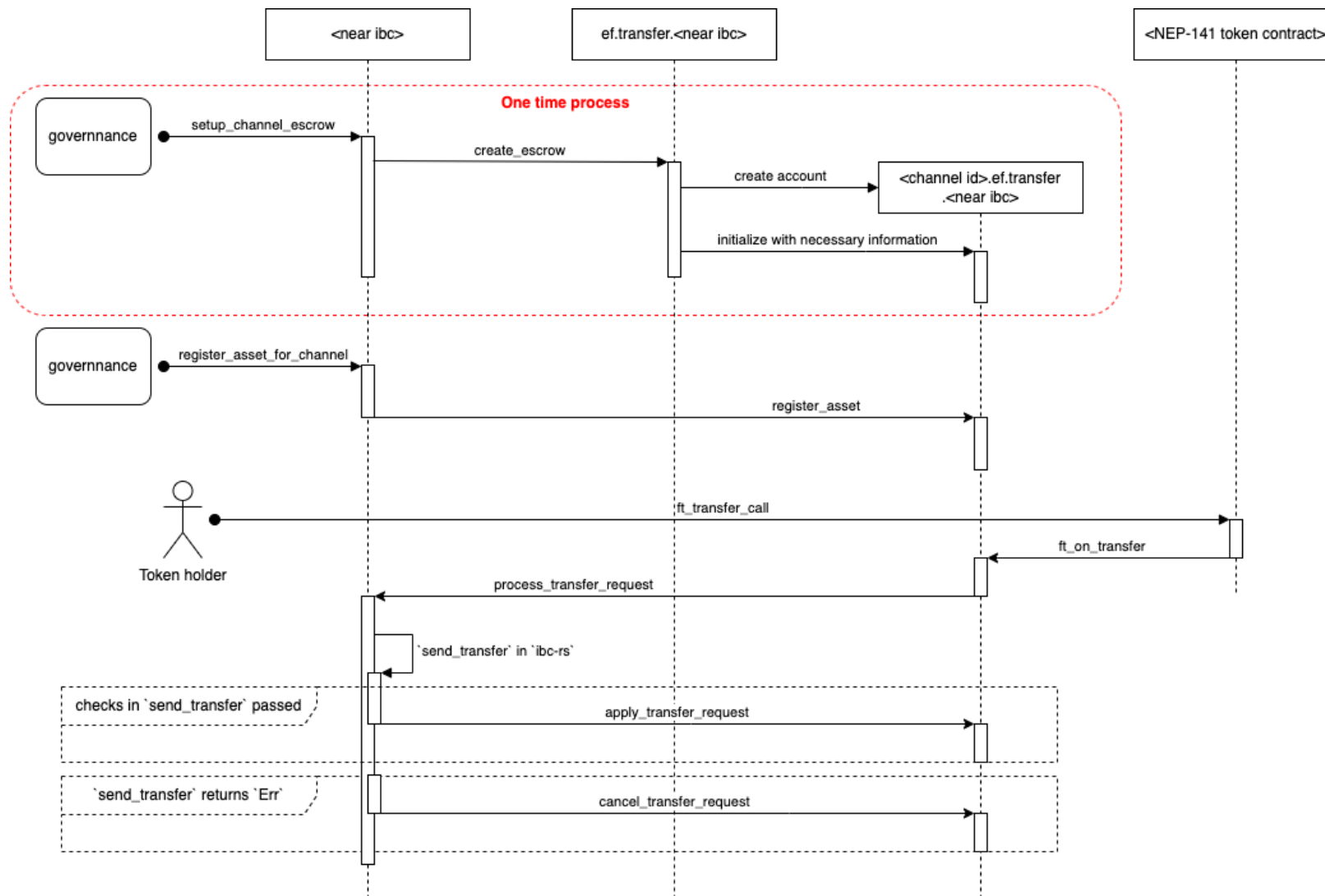
NEAR-IBC solution

Redeem cross-chain asset from NEAR protocol back to the source chain:



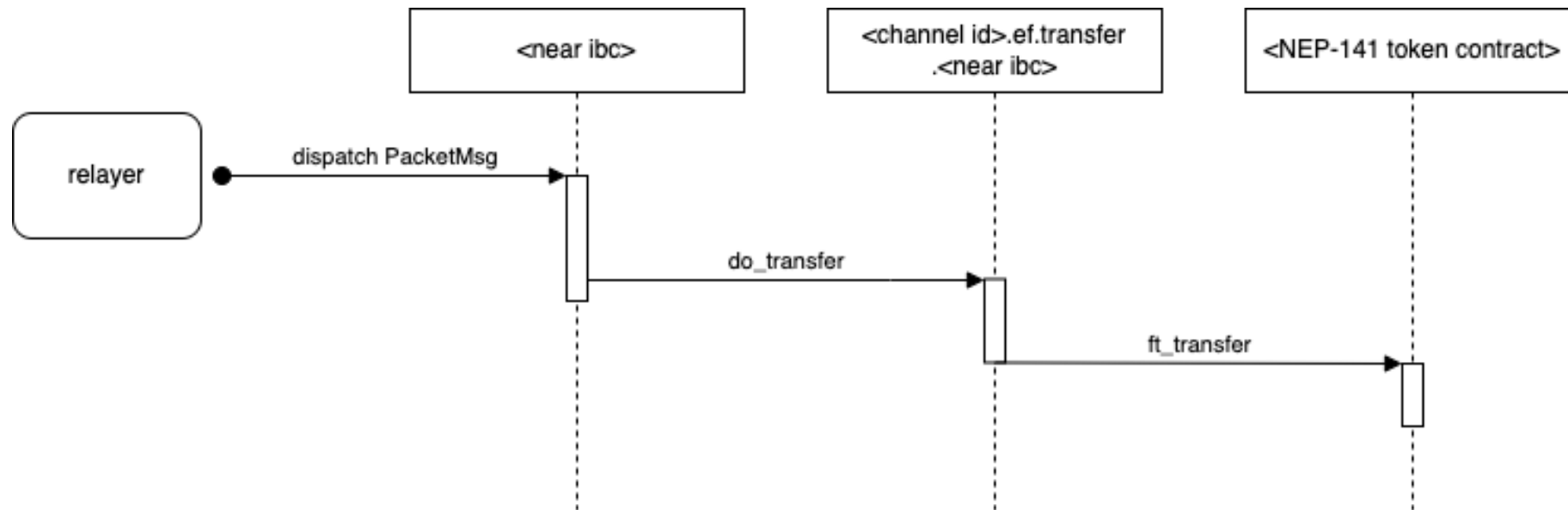
NEAR-IBC solution

Transfer asset from NEAR protocol to other chains:



NEAR-IBC solution

Redeem cross-chain asset from other chains back to NEAR protocol:



Further thoughts

Unleashing the power of the open protocol ecosystem:

- Octopus LPOS
- Interchain account
- NFT transfer
- Middleware
- Atomic swap

More possibilities on NEAR-IBC ...

Thanks !

