

Ephemera cluster

Ephemera can run as a separate process or embedded as a library

Ephemera node

Rust Client

- SubmitEphemeraMessage
- QueryBlockByHeight
- QueryBlockByHash
- QueryLastBlock
- QueryBlockCertificates
- QueryDht
- StoreInDht
- QueryEphemeraConfig
- QueryBroadcastGroup
- QueryBlockBroadcastInfo
- VerifyMessageInBlock

Http REST API

Similar interface to Rust client

Application

- checkTx
- checkBlock
- deliverBlock

User provided implementation to add custom logic into message and block processing flow

Ephemera Core

- Receive messages from network
 - call Application *checkTx*
 - add to mempool
 - gossip to other peers
- Create blocks
 - Call Application *checkBlock*
 - Prune mempool
 - Start "consensus" with peers
- Receive blocks from network
 - Verify membership
 - Run "consensus"
- "Deliver" blocks
 - call Application *deliverBlock*
 - store block(+ signatures, merkle tree) in Database
 - send block to Websocket subscribers
- Process Rust/Http API requests

Storage(SqlLite/RocksDb)

- Blocks
- Block membership
- Signatures
- Merkle Tree

Send new blocks created by current node as well responses to blocks created by other nodes as part of "consensus" process

Upon receiving a message from client, gossip it also to other nodes

Any external resource which can be called by "user" provided code to receive list of peers which "user" considers valid at any given moment

Networking/Libp2p

Send/Receive Blocks

Request Response Behaviour

Connects directly to current set of peers to send and receive blocks

Request Current Peers

Receive membership updates

Membership Behaviour

At configured interval calls a "user" provided function to receive new set of peers.

Checks which peers are online. Notifies Ephemera about membership change

Notifies other peers that it has received updated set of peers. This helps to keep membership in sync between members

DHT and closes peers

Kademlia Behaviour

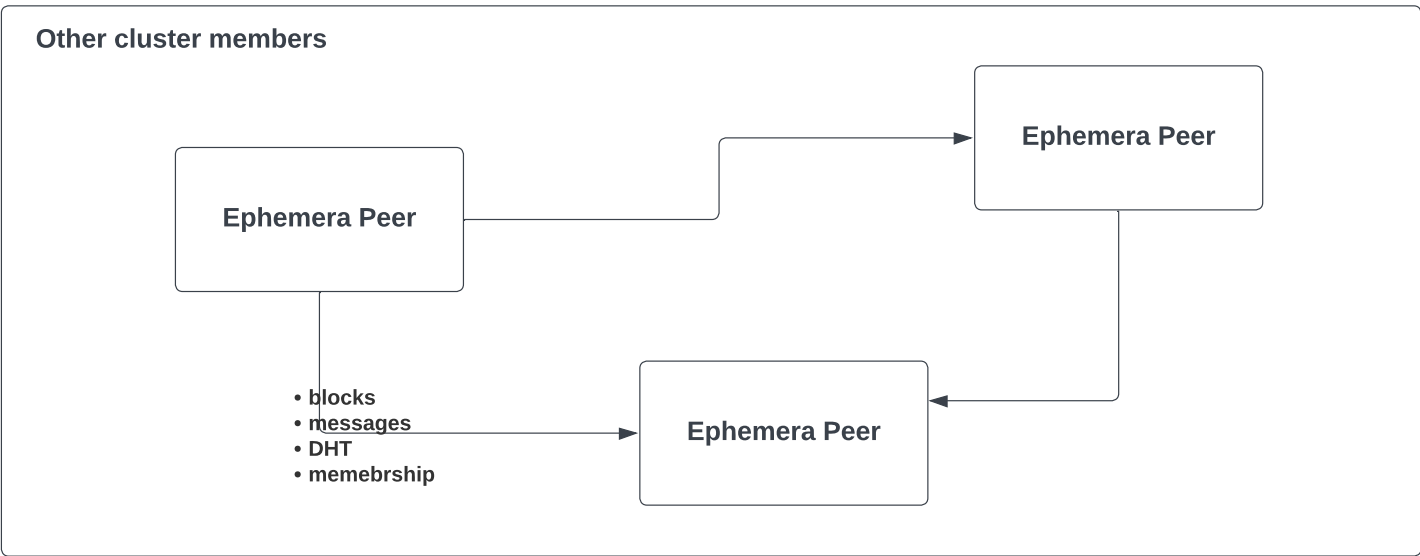
Provides DHT functionality. Any Ephemera user can store and query DHT for custom functionality

Used also by Gossipsub to receive closest neighbours

Send/Receive messages(transactions)

Gossip(sub) behaviour

Runs libp2p Gossipsub protocol. It's an optimised version of plain gossip protocol



• blocks
• messages
• DHT
• membership