# A short introduction to Canis Major

Notarizing interaction with NGSI-LD

Open APIs for Open Minds

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"Canis Major is an adaptor that supports persistence and verification of NGSI-LD Entity-Transactions in blockchains"

- currently persistence into ETH-compatible blockchains like Alastria
- handles entity-creation(POST), retrieval(GET) and batch-creation(POST)
- API is a subset of the NGSI-LD API
- Responds the Transaction-Receipt
- all blockchain transactions are additionally stored as an Entity inside a broker
- Query-API to retrieve transaction-data by entities

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- uses SmartDatamodel for distributed ledger:
    - https://github.com/smart-data-models/dataModel.DistributedLedgerTech

```
{
    "blockHash": "0x69f995d45f20d44de148b4a2ed349b1e00c15e32731c7d8337fc68170726ec9a",
    "blockNumber": 2,
    "blockNumberRaw": "0x2",
    "cumulativeGasUsed": 23866,
    "cumulativeGasUsedRaw": "0x5d3a",
    "from": "0xa508dd875f10c33c52a8abb20e16fc68e981f186",
    "gasUsed": 23866,
    "gasUsedRaw": "0x5d3a",
    "logs": [...],
    "logsBloom": "...",
    "status": "0x1",
    "statusOK": true,
    "to": "0x476059cd57800db8eb88f67c2aa38a6fcf8251e0",
    "transactionHash": "0x1f282be990bcb343592ae8cf8d0d936a03cfbeaff7c83beb0987d3c364f9ecac",
    "transactionIndexRaw": "0x0"
}
```

- only stores hashes - less costs, no plaintext data
- transaction stored in the broker are related to the original-entity
    - concrete change can be reconstructed
    - hash can be used to verify the change

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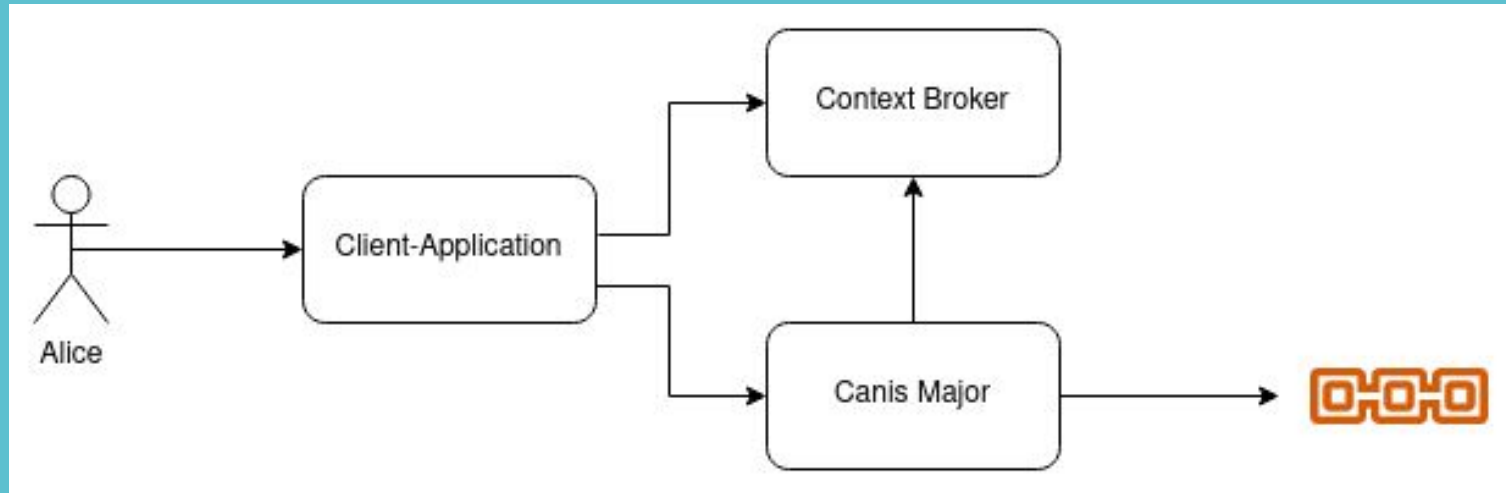
- Client application calls Canis Major & Context Broker
- Canis Major generates the hash and persists the transaction to the Blockchain
- Canis Major stores transaction receipt in Context Broker
- Canis Major relates the transaction receipt to original entity

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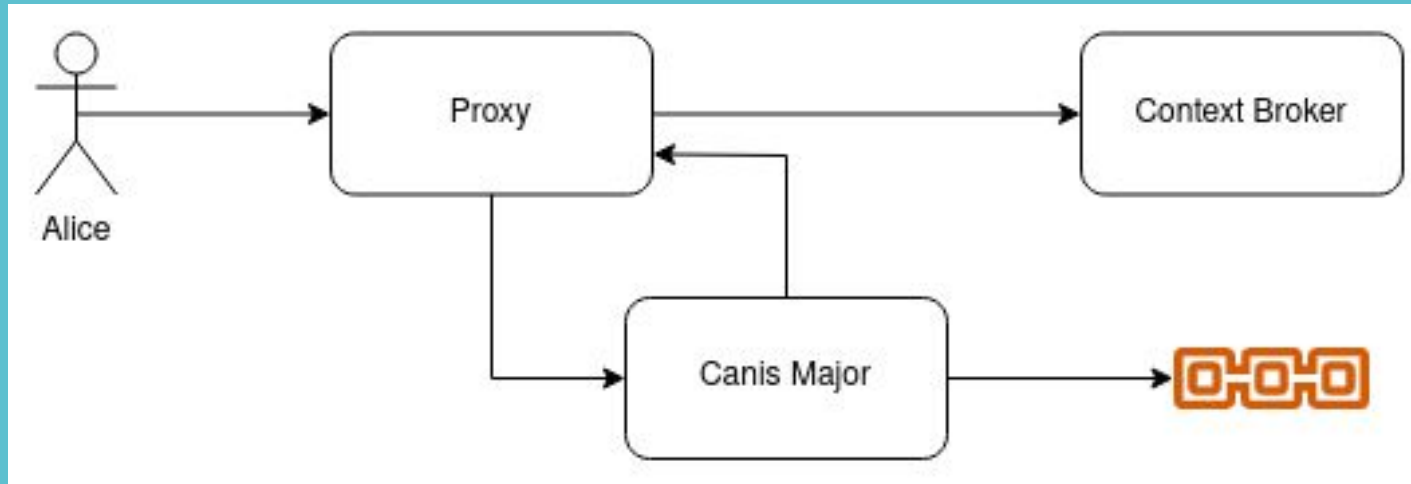
- Alternative: proxy in front of the broker, handling the connection to Canis Major transparently
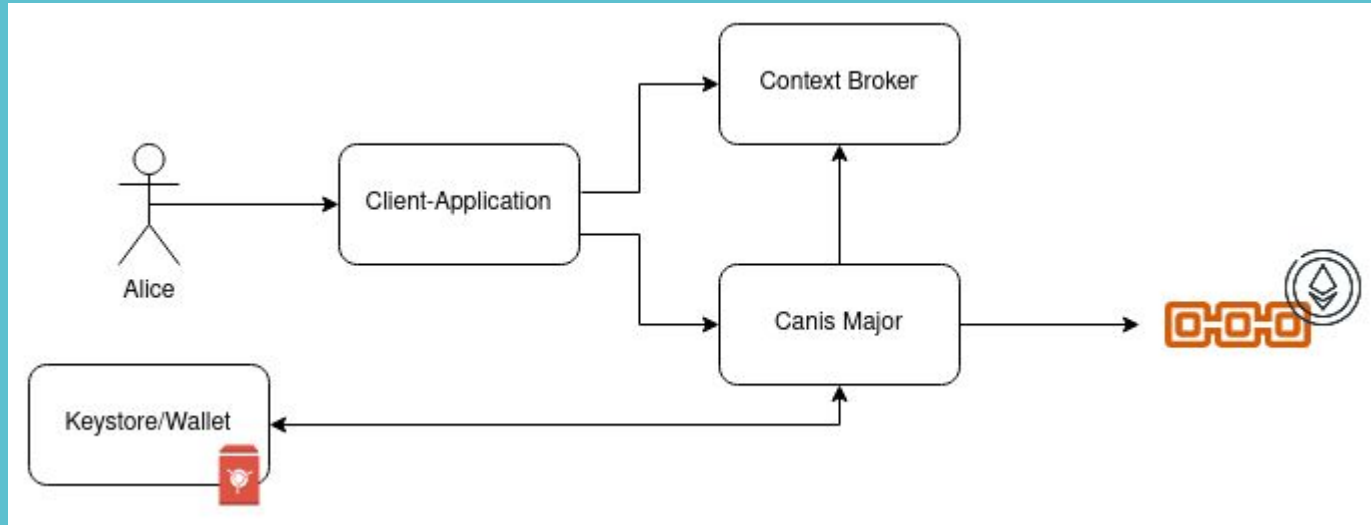
- Canis Major can sing transactions with a default key
- supports the usage of external wallets:
  - client sends information about singing-endpoint to Canis Major
  - Canis Major creates Transaction-Object and sends it for signature to clients keystore
  - Keystore signings and sends back
  - Canis Major persists signed transaction to dlt

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Demo-Scenario:

1. Customer Alice orders a packet in a store
2. Bicycle-Courier Bob takes the packet for delivery from the store
3. Alice receives the packet from Bob
4. A manager checks the status of the packet

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# Links:

- https://github.com/FIWARE/CanisMajor
- Running deployment on K8s:
  - https://github.com/FIWARE-Ops/fiware-gitops/tree/master/aws/token
- Integration tests:
  - https://github.com/FIWARE/CanisMajor/tree/master/it
- Docker Compose:
  - https://github.com/FIWARE/CanisMajor/tree/master/it/docker-compose
- Smart Datamodel:
  - https://github.com/smart-data-models/dataModel.DistributedLedgerTech
- Demo Postman-Collection:
  - https://github.com/wistefan/presentations/blob/main/wednesday-webinar/canismajor/CanisMajor-demo.postman_collection.json

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# Thank you!

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