

ChainVote

Project for Distributed Systems Course

ISI @ UniBo

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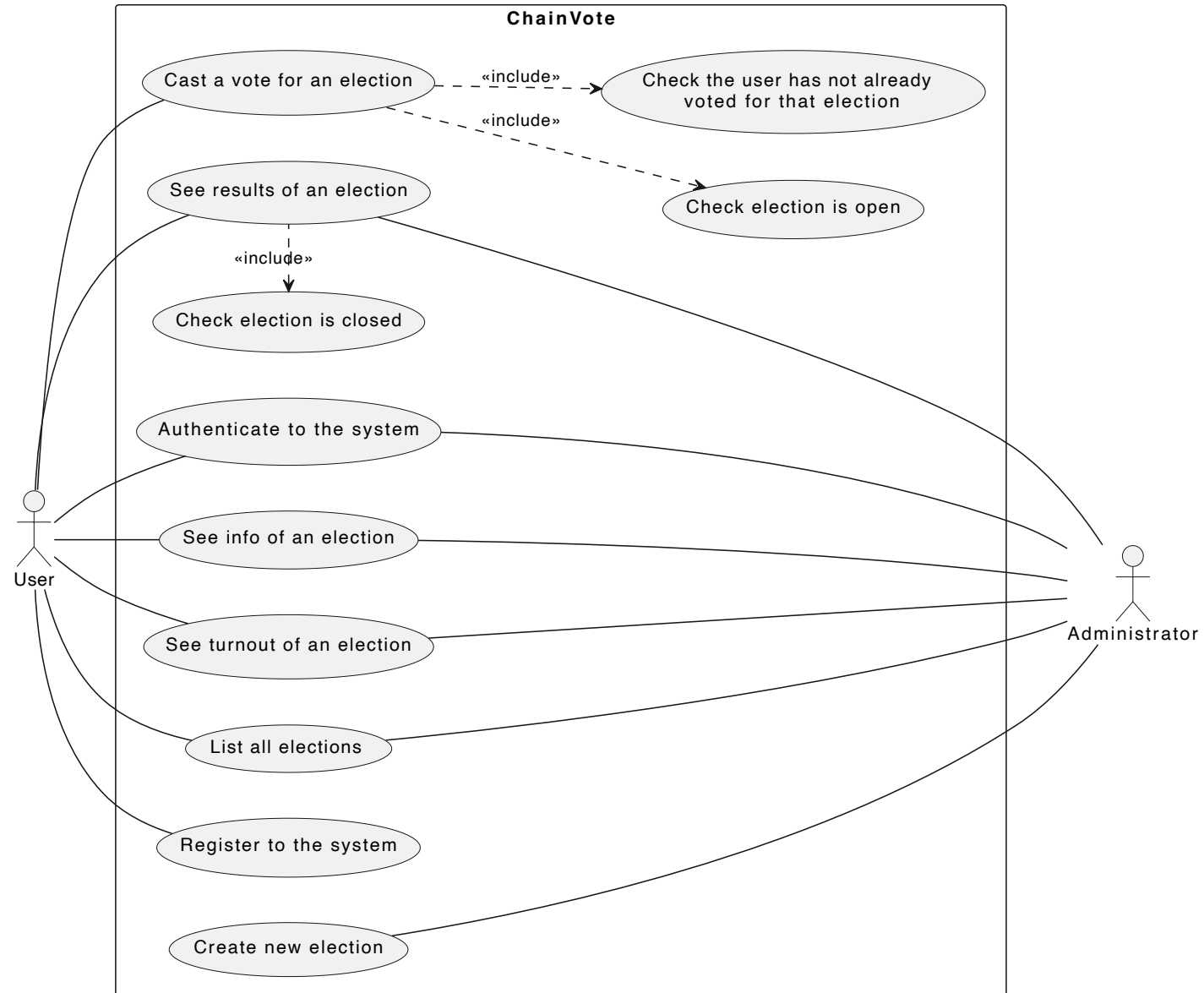
Outline

1. Project's Goals
2. Use cases
3. Non-functional properties
4. Technologies
5. System Architecture
6. Blockchain Architecture
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Project's Goals

- **Small-scale** distributed electronic voting system
- *Blockchain technology*
- Uniform API to interact with the system by means of a web application

Use cases



Non-functional properties (I)

Thanks to *blockchain technology* we achieve:

- Operational integrity of the system:
 - Correctness of the operations performed by the system
- Accountability:
 - Node Peers logs the actions performed
- Confidentiality:
 - We used a **Permissioned blockchain** that restrict access to data
- Verifiability:
 - Blockchain keep **tracks of all the transactions** executed to obtain final results
- Availability:
 - System will continue to serve requests even if some peers are down

Non-functional properties (II)

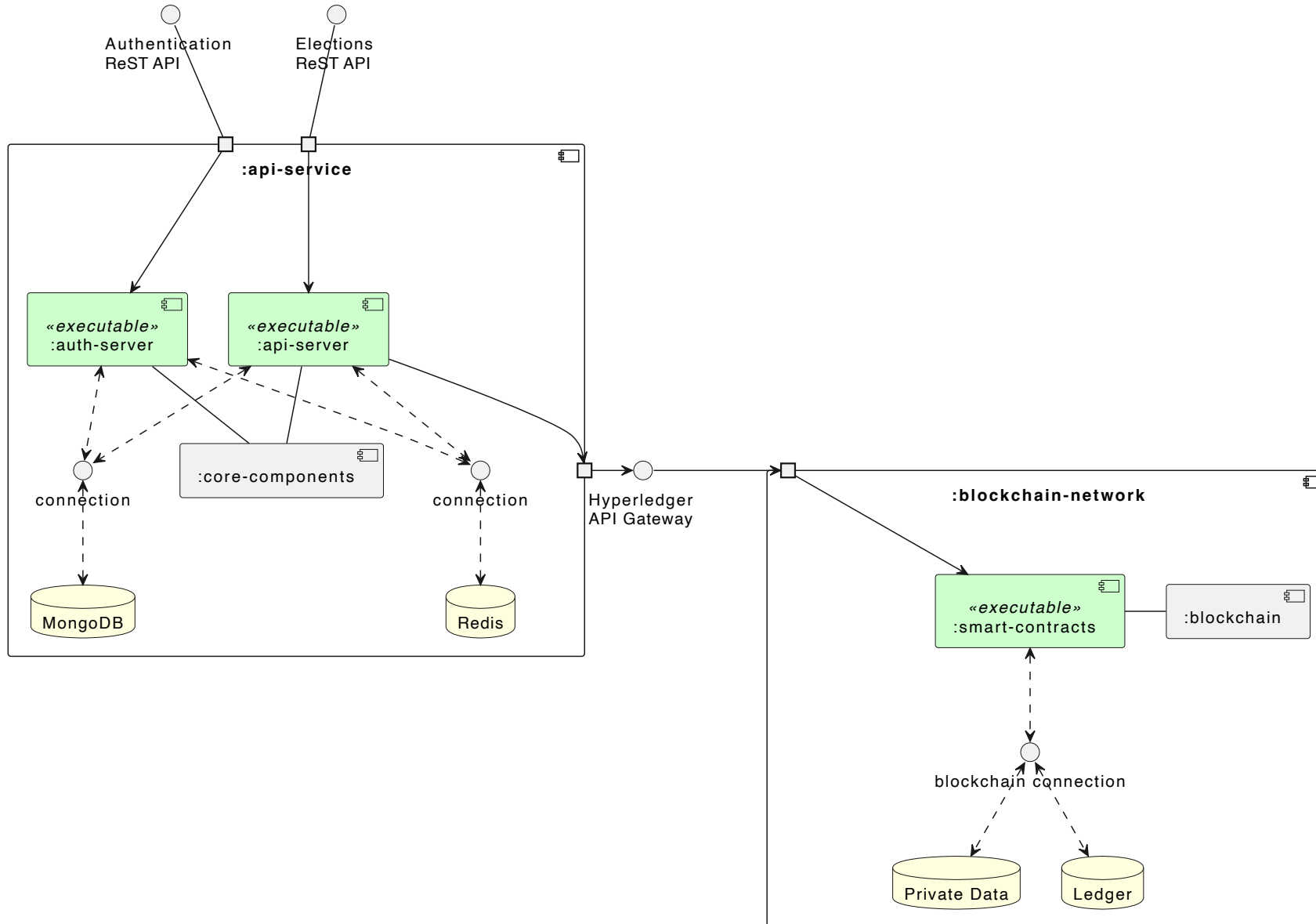
We also designed the system to achieve:

- Non-coercibility:
 - **Voters are not identifiable** during the voting process $\Rightarrow$ one time codes
- Voter Authentication:
 - Voters authentication provided by the API layer

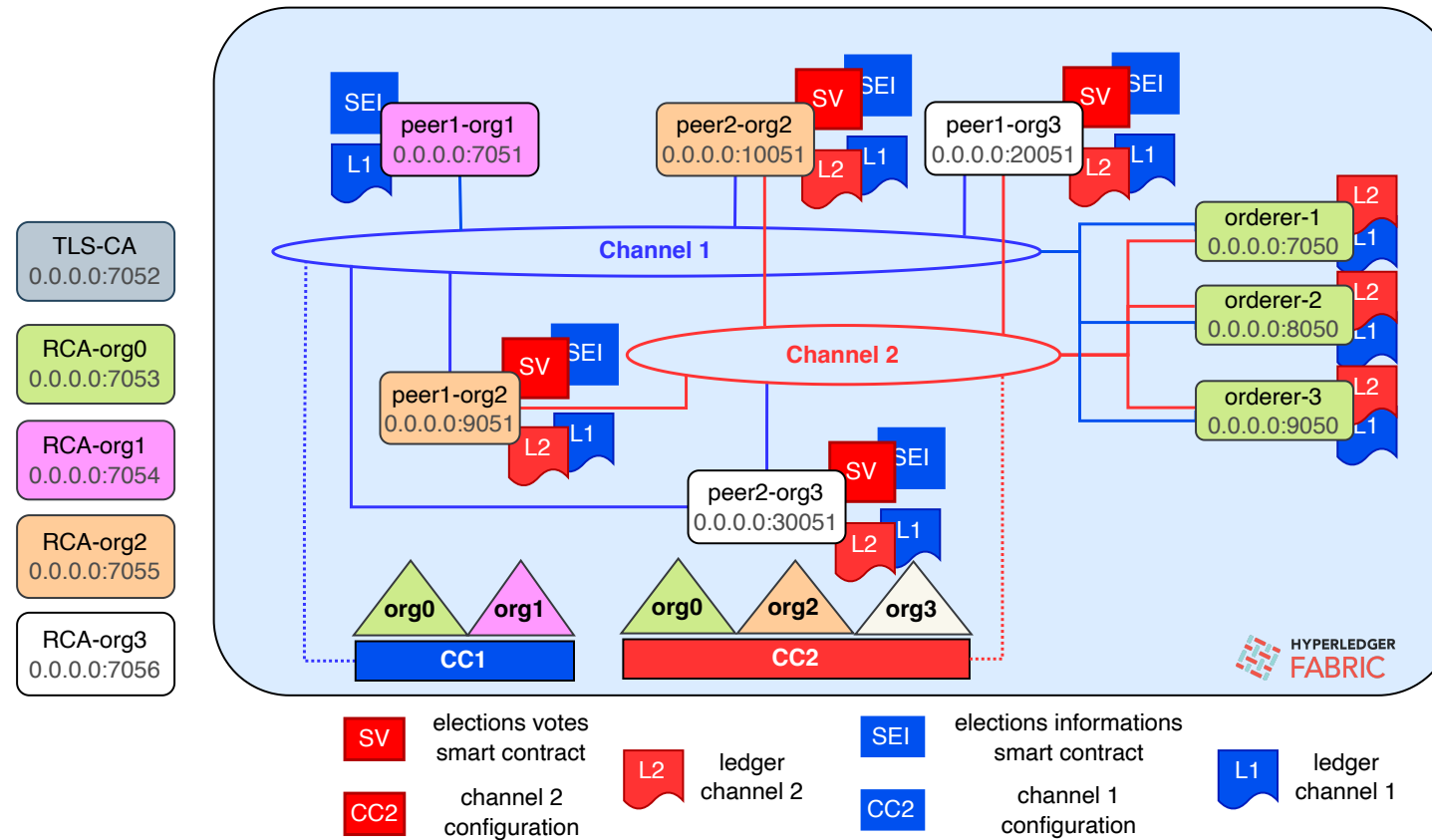
Technologies

- **Hyperledger Fabric** as the blockchain infrastructure technology
 - modular and highly-configurable
 - *Java* as a language for smart contracts
 - offers mechanisms raising the bar of confidentiality and higher fine-grained control over ledger access (e.g. channels and private data)
- *Docker* for deployment
- ReSTful API
 - *Nodejs + Express* for the API layer

System Architecture



Blockchain network



[Demo \(click here\)](#)

That's all, thank you for your attention!

