TDDD25: Distributed Systems Programming Project

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Computer and Information Science
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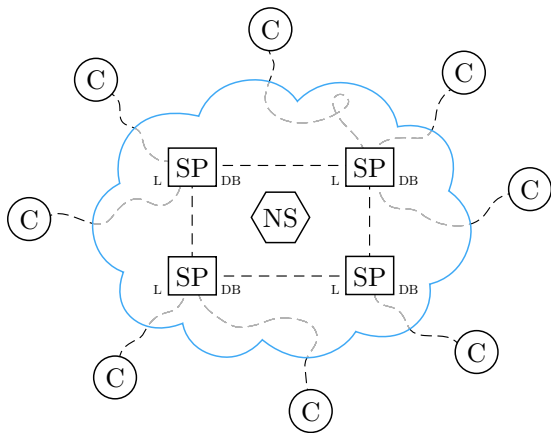
Contact

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Organization

`https://www.ida.liu.se/~TDDD25/`

- 1 teaching session
- 7 lab sessions
- $1 + 5$ labs
- 4 groups
- Registration deadline: TBA
- Completion deadline: TBA

Distributed Database

C — client
SP — server/peer
NS — name service
DB — database
L — lock

Source Code

`https://gitlab.ida.liu.se/TDDD25/labs/`
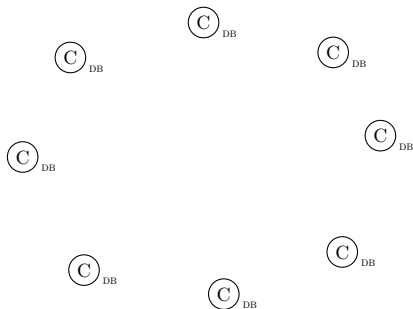
- doc/
- src/
  - lab0/
  - lab1/
  - lab2/
  - lab3/
  - lab4/
  - lab5/
  - modules/
    - Common/
    - Server/

Implementation

- Multi-threaded object-oriented code in Python 3
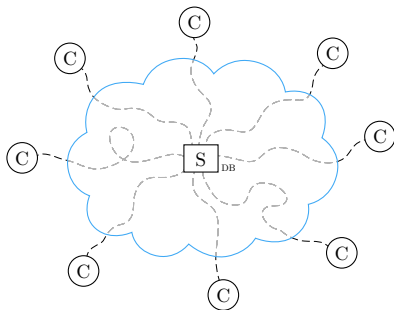- Communication via objects serialized in JSON
- Data transfer through TCP sockets

Lab 0: Standalone Database

- Local database for each client (C)
- TODO: complete the implementation of the read and write operations of the database (DB)

```
https://gitlab.ida.liu.se/TDDD25/labs/raw/master/doc/lab0.pdf
```

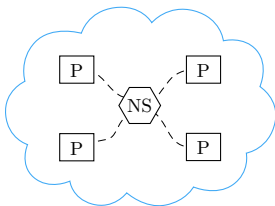# Lab 1: Client-Server Database

- Centralized database (DB)
- TODO: complete the implementation of the client (C) and server (S) communication mechanism

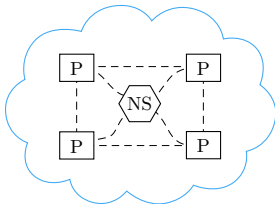 https://gitlab.ida.liu.se/TDDD25/labs/raw/master/doc/lab1.pdf

Lab 2: Object Request Broker

- Name service (NS) and object request broker (ORB)
- Abstract away the communication part of the functionality
- TODO: complete the implementation of the ORB

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https://gitlab.ida.liu.se/TDDD25/labs/raw/master/doc/lab2.pdf
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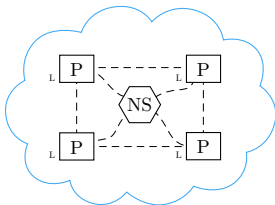
Lab 3: Peer-to-Peer Communication

- Smart mechanism for keeping track of peers (P)
- TODO: complete the functionality dealing with the peers joining or leaving the system

```
https://gitlab.ida.liu.se/TDD25/labs/raw/master/doc/lab3.pdf
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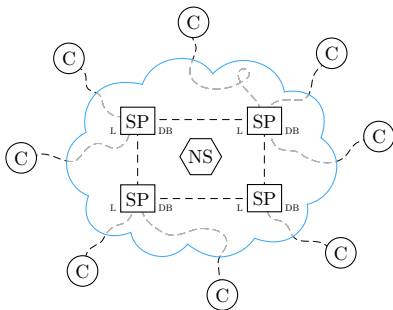
Lab 4: Distributed Locks

- Distributed mutual exclusion to control concurrent operations
- TODO: complete the implementation of the second Ricart–Agrawala algorithm (L)

```
https://gitlab.ida.liu.se/TDDD25/labs/raw/master/doc/lab4.pdf
```

Lab 5: Client-Server Database with Replicas

- Everything together
- TODO: complete the implementation of the server/peer (SP) using all the previously developed components

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https://gitlab.ida.liu.se/TDDD25/labs/raw/master/doc/lab5.pdf
```

Submission

- No written reports are needed
- Make your code available on GitLab
- Add your teaching assistant as a Reporter
- Demonstrate your solutions in class

Good luck!