



Programming Principles of Distributed Systems

Preface

Seminar Research Trends in Parallel and Distributed Systems
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Seminar Programming Principles of Distributed Systems

People



Prof.
Stefan Wesner

- Director of RRZK/ITCC
Director PDS
- Leading IT centers for more than 10 years now
- Long history in High Performance, Grid and Cloud Computing
- Strong network expertise



Dr.
Lutz Schubert

- Research lead of PDS
- Core scientist in CDS
- Chair of CAA
- Expertise in High Performance Computing, Cloud Computing and Operating Systems
- also digital humanities, archaeology

People



M. Sc.
Robert Keßler

- PhD student at PDS
- Background and interest in Multi Agent Systems, Distributed Computing and Embedded Systems

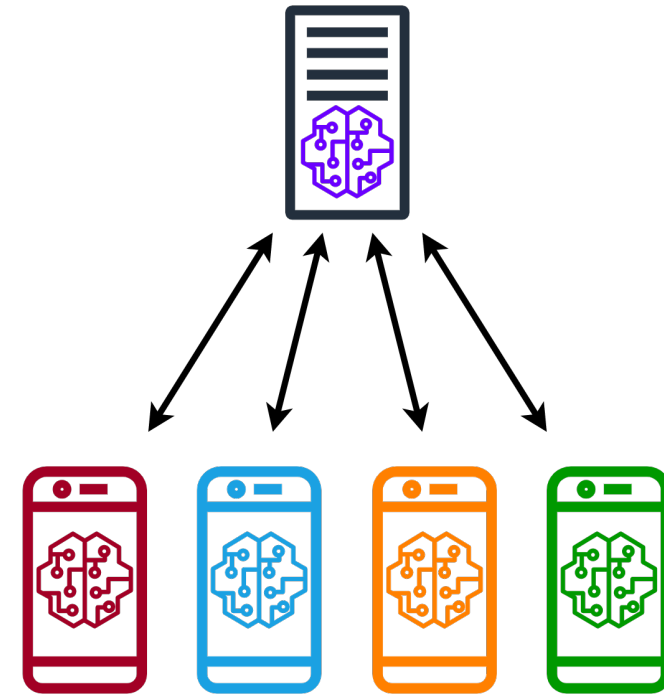
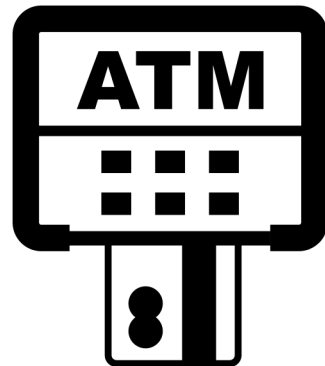
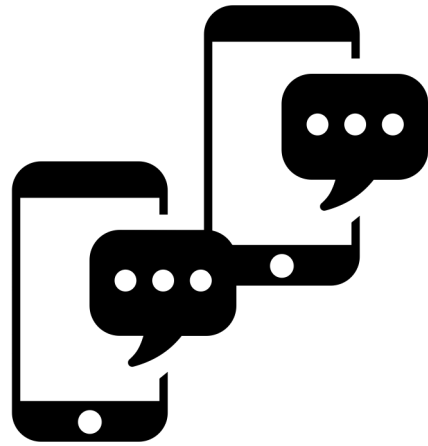
Target audience

- Master students of the the study programmms:
 - Informatik
 - Wirtschaftsmathematik
 - Mathematik

Background questions

- What are you studying?
- Have you already learned something about distributed systems or networks?
- What is your programming experience so far?
 - Languages
 - Frameworks
 - ...

Distributed Systems



Distributed Systems

What are they?

- There is a whole range of definitions:

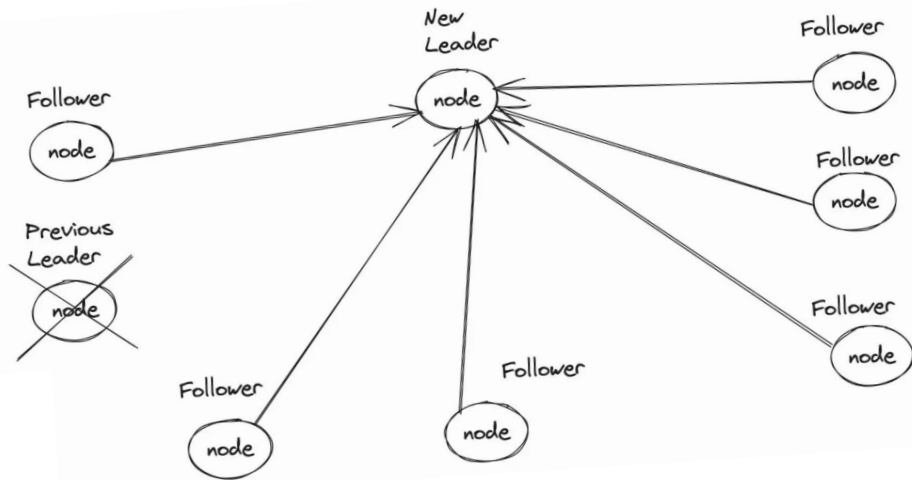
A. Tanenbaum: “A distributed system is a collection of independent computers that appears to its users as a single coherent system.”

M. van Steen: “A distributed system is a networked computer system in which processes and resources are sufficiently spread across multiple computers.”

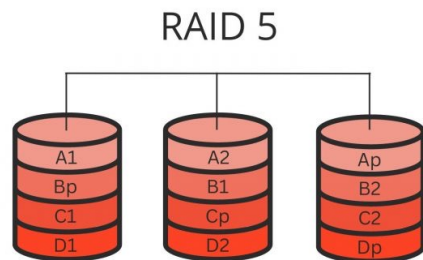
L. Lamport: “A distributed system is one in which the failure of a computer you didn’t even know existed can render your own computer unusable.”

Topics

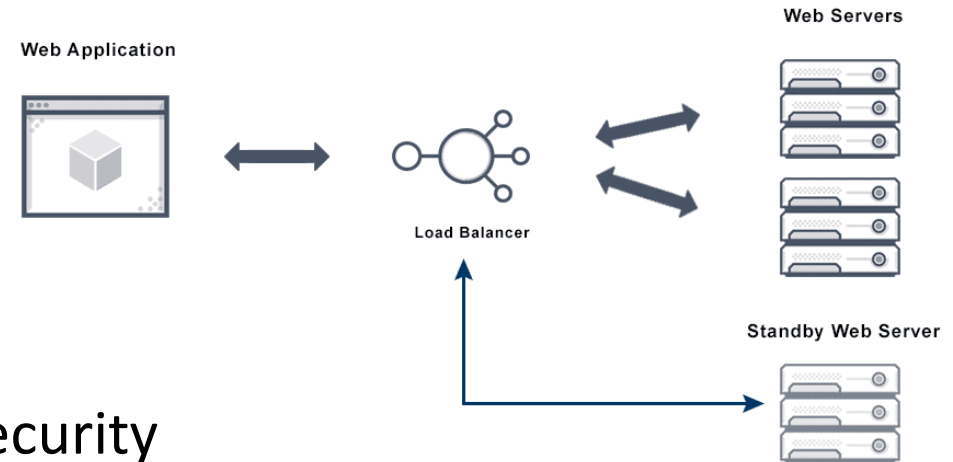
Coordination



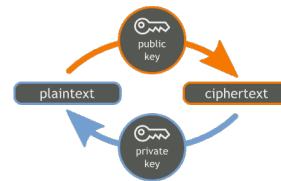
Consistency & Replication



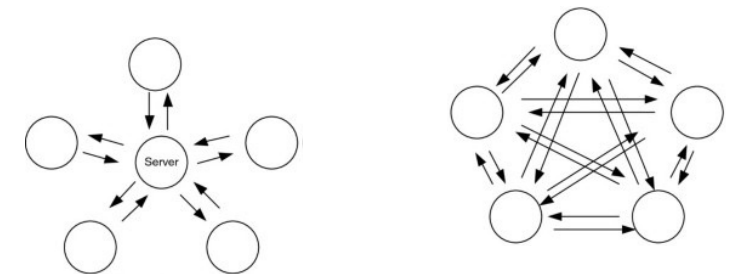
Fault tolerance



Security



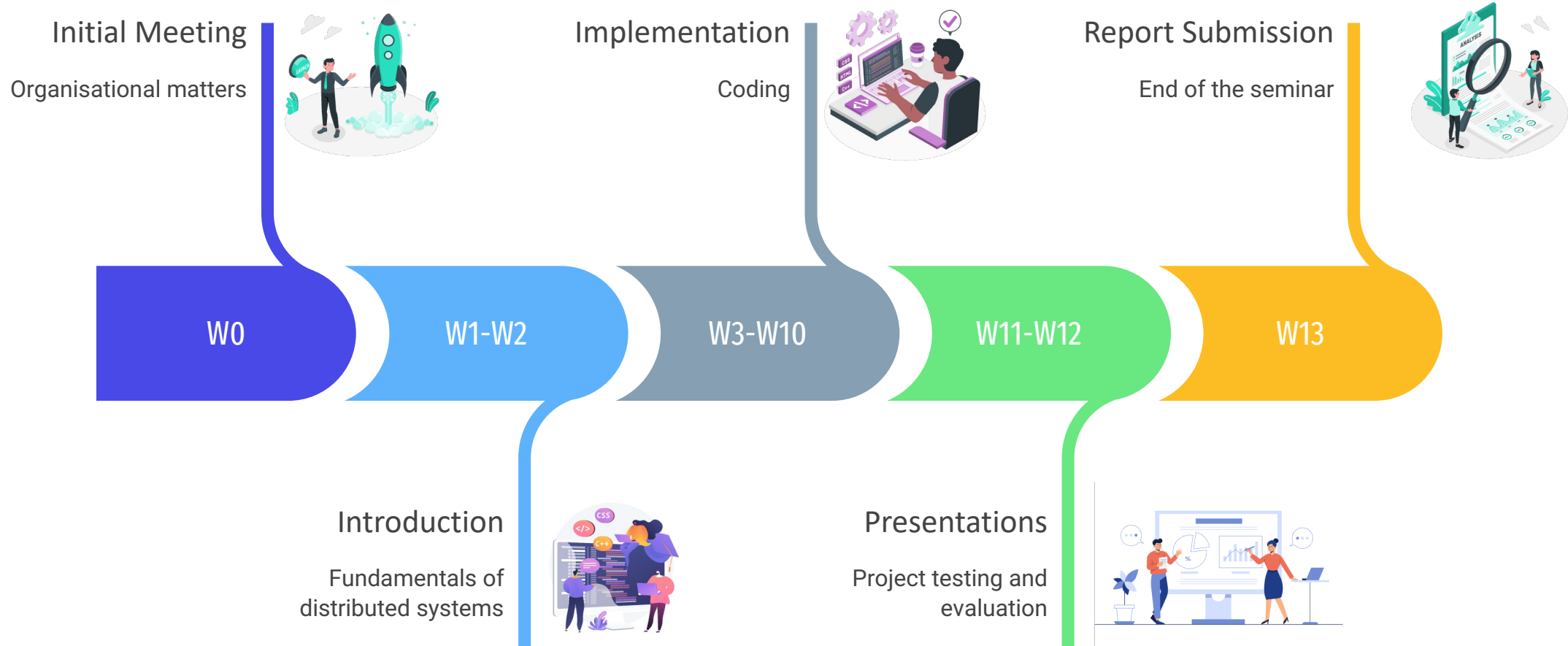
Communication



Organisation

- Weekly Meetings
- Working on projects in groups of up to 3 students
 - Projects will deal with and implement aspects from the previously shown topics in distributed systems
- Exemplary project:
 - Implement a distributed fault-tolerant RAID-5 storage for a simulated data center

Semester Schedule



*** This timetable is intended as a guideline and is not absolutely fixed**

Registration

- If you like to participate in the seminar, send a mail to:

kessler@uni-koeln.de

- Deadline to register is **July 17, 2024**
- First come, first serve (only up to 12 participants)