
Distributed Systems

Winter Term 2024/25

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Stand: October 10, 2024

Distributed Systems

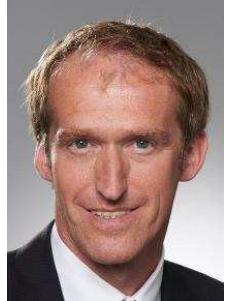
Winter Term 2024/25

0 Organisation

About Myself

- Studies in Computer Science, Techn. Univ. Munich
 - Ph.D. in 1994, state doctorate in 2001
- Since 2004 Prof. for Operating Systems and Distributed Systems
- **Research:** Secure component based systems; Pattern recognition in network data; Parallel and distributed systems
- **Mentor** for Bachelor Studies in Computer Science with secondary field Mathematics (PO 2012); Head of Examination Board

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- **Office Hour:** Mon., 14:15-15:15



Andreas Hoffmann

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0271/740-4047

H-B 8405

- ➔ E-assessment and e-labs
- ➔ IT security
- ➔ Web technologies
- ➔ Mobile applications



Felix Breitweiser

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H-B 8406

- ➔ Operating systems
- ➔ Programming languages
- ➔ Virtual machines



Sven Jacobs

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H-B 8407

- ➔ E-assessment and e-labs
- ➔ Generative artificial intelligence
- ➔ Web technologies

Lectures/Labs

- Rechnernetze I, 6 CP (Bachelor, summer term)
- Rechnernetze Praktikum, 6 CP (Bachelor, winter term)
- Rechnernetze II, 6 CP (Master, summer term)

- Betriebssysteme und nebenläufige Programmierung, 6 CP (Bachelor, summer term)
- Parallel processing, 6 CP (Master, winter term)
- Distributed systems, 6 CP (Bachelor, winter term)

Project Groups

- e.g., secure cooperation of software components
- e.g., concepts for secure management of Linux-based thin clients

Theses (Bachelor, Master)

- Topic areas: secure virtual machine, parallel computing, pattern recognition in sensor data, e-assessment, ...

Seminars

- Topic areas: IT security, programming languages, pattern recognition in sensor data, ...
- Procedure: block seminar (30 min. talk, 5000 word paper)
- Master: attend the lecture “Scientific Working” beforehand!
 - block course end of Feb. / beginning of March

About the Lecture

→ **Lecture:**

- Thursday, **08:30 - 10:00**, room H-C 6321

→ **Exercises:**

- Thursday, 10:15-11:45, room H-C 6321
- start: 24.10.2024
- includes programming exercises using Java

Information, Slides and Announcements

→ **On the course's webpage:**

<http://www.bs.informatik.uni-siegen.de/lehre/vs>

- If necessary, updates/supplements shortly before the lecture
 - look at the date!
- Exercise sheets will be put online as PDF
 - please print and process them yourself!
- There is also a moodle course
 - submission of mandatory exercise solutions
 - lecture recordings from the summer term 2021(!)

Registration for “Course Achievement” (Studienleistung)

- For exam regulations 2019 and newer: passing the course requires successful completion of homework:
 - 10 exercise sheets with two mandatory exercises
 - 6 exercise sheets must be successfully processed
- You must register for “4INFBA303-S - Coursework Distributed Systems” **before you can submit a solution!** (do it right now!)
 - independent of the registration to the course and the lab!
 - if you cannot complete the course work: **deregister** again!

The screenshot shows a list of course components for "4INFBA303 - Verteilte Systeme".

- 4INFBA303 - Verteilte Systeme** - empf. FS 4 - Wahlpflicht - 6,0 Credits
- 4INFBA303-VG1 - Verteilte Systeme (Vorlesung)** - empf. FS 4 - Pflicht
- 4INFBA303-VG2 - Verteilte Systeme (Übung)** - empf. FS 4 - Pflicht
- 4INFBA303-S - Studienleistung Verteilte Systeme** - empf. FS 4 - Pflicht - 2,0 Credits **Anmelden**
- 4INFBA303-P - Prüfungsleistung Verteilte Systeme** - empf. FS 4 - Pflicht - 4,0 Credits **Anmelden**

Examination

- Oral examination
 - duration about 30-40 minutes
- Registration:
 - first register at the campus management system (unisono)
 - at least 1 week before the exam date (better 3-4 weeks)
 - then fix a date with my secretary (Ms. Zetzsche, H-B 8403)
 - at least 1 week before the exam date (better 3-4 weeks)
 - phone: -4048
 - email: bsvs.zetzsche@eti.uni-siegen.de
 - cancellation is possible up to 7 days before the exam
 - via unisono
 - please inform me, too!

Contents of the Lecture

- Introduction
- Middleware
- Distributed programming with Java RMI
- Name services
- Process management
- Time and global state
- Coordination
- Replication and consistency
- Distributed file systems
- Fault tolerance

Learning targets

- Understand the properties of distributed systems
 - absence of a global state
 - problems with synchronization and with consistency of replicated data
- Understand the approaches to solve the problems and be able to apply them to given challenges
- Distinguish architecture models for distributed systems as well as different types and tasks of middleware and be able to assess their usability for given problems
- Be able to develop simple distributed programs with Java RMI

- Andrew S. Tanenbaum, Marten van Steen. *Verteilte Systeme, Grundlagen und Paradigmen*. Pearson Studium, 2003.
(English: *Distributed Systems: Principles and Paradigms, 2nd Edition*. Pearson Education, 2016. Available [online](#).)
 - Ulrike Hammerschall. *Verteilte Systeme und Anwendungen*. Pearson Studium, 2005.
 - George Coulouris, Jean Dollimore, Tim Kindberg. *Verteilte Systeme, Konzepte und Design, 3. Auflage*. Pearson Studium, 2002.
(English: *Distributed Systems: Concepts and Design, 5th Edition*. Pearson Education, 2012.)
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- Andrew S. Tanenbaum. *Moderne Betriebssysteme, 2. Auflage*. Pearson Studium, 2003.
 - William Stallings. *Betriebssysteme – Prinzipien und Umsetzung, 4. Auflage*. Pearson Studium, 2003.

Literature ...

- Jim Farley, William Crawford, David Flanagan. *Java Enterprise in a Nutshell*. O'Reilly 2002.
- Cay S. Horstmann, Gary Cornell. *Core Java 2, Band 2 – Expertenwissen*. Sun Microsystems Press / Addison Wesley, 2008.
- Robert Orfali, Dan Harkey. *Client/Server-Programming with Java and Corba*. John Wiley & Sons, 1998.
- Torsten Langner. *Verteilte Anwendungen mit Java*. Markt + Technik, 2002.