inf105 - Fault Tolerance in Distributed Systems

Module name: Fault Tolerance in Distributed Systems

Module code: inf105

ECTS credit points: 6.0 KP

Workload: 180 h

Used in degree programmes:
- Master's Programme Computing Science > Mastermodule
- Master's Programme Embedded Systems and Microrobotics > Akzentsetzungs module

Contact person:
Module responsibility
- Oliver Theel
- Die im Modul Lehrenden

Authorized examiners
- Die im Modul Lehrenden
- Die Modulverantwortlichen

Module counseling
- Die im Modul Lehrenden

Prerequisites:

Skills to be acquired in this module:
This module provides knowledge of fault-tolerant distributed systems. The terminology, structure, conception, core challenges and related implementation concepts will be covered in detail.

Professional competence
The students:
- Assess what a fault-tolerant distributed system is and develop awareness of its capabilities
- Name and discuss common implementations of fault-tolerant distributed systems

Methodological competence
The students:
- Reflect the implementation challenges of a distributed system
- Are able to adapt and evolve implementation concepts of fault-tolerant distributed systems in new contexts

Social competence
The students:
- Solve problems in small teams
- Present their solutions to the members of the tutorial
- Discuss their different solutions with members of the tutorial

Self-competence
The students:
- Accept criticism
- Question their initially applied methods for problem solving
- Question their initial solutions in the light of newly learned methods
Module contents

1) Fault, Error, Failure
2) Failure semantics, Fault tolerance
3) Byzantine agreement protocols
4) Stable storage
5) Fail-stop processors
6) Atomic commit protocols
7) Classification of replication control schemes
   • pessimistic vs. optimistic
   • semantic vs. syntactic
   • static vs. dynamic
8) Consistency notions
9) Quality criteria
10) Survey of replication control schemes
11) Design of replication control schemes
12) Unifying frameworks
13) Replication in practice

Recommended reading


Links

Language of instruction

German

Duration (semesters)

1 semester

Module frequency

jährlich

Module capacity

Unlimited

Information

connectet with:
Betriebssysteme 1 und 2
Betriebssysteme-Praktikum
Verteilte Betriebssysteme

Modullevel

AS (Akzentsetzung / Accentuation)

Modulart

Wahlpflicht / Elective

Lern-/Lehrform / Type of program

V+S or V+Ü

Vorkenntnisse / Previous knowledge

Verteilte Betriebssysteme

Examination

Examination periods

Type of examination

Final exam of module

End of lecture period

written exam or oral exam or practical work

Course type

Comment

SWS

Course frequency

Workload attendance

Lecture

2

WinSem

28 h
<table>
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<td>seminar or exercise</td>
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<td>2</td>
<td>WinSem</td>
<td>28 h</td>
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**Total attendance time for module**

56 h