

Advanced Operating Systems

Academic Year 2015/16

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Coordinator

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Collaborator (Lab.)

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Background

- Operating systems
- Networks
- Computer architecture
- Advanced computer architecture

Syllabus (theory)

- Non traditional OS architectures
- Distributed operating systems
 - Architecture
 - Communication
 - Synchronization
 - Distributed file system
 - Distributed shared memory
- Real-time operating systems (RTOS)
 - Problems
 - Real/time scheduling

Syllabus (laboratory)

- eCos operating system
 - Configuration, use and customization
- ZigBee protocol
 - Compiling and applications
- Mobile terminal
 - Development environment and applications
- Smartphone applications
 - iPhone, Android, WinPhone 7

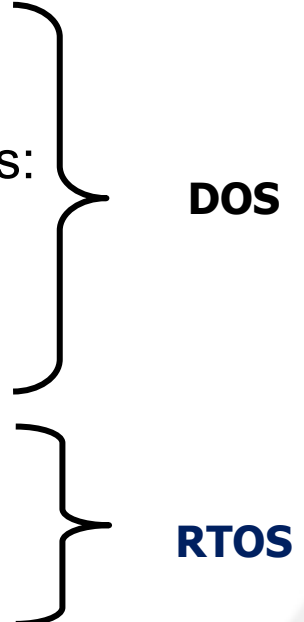
Timetable

- 1 semester(5h/week)
 - Wednesday 15:30-18:00 (room C)
 - Friday 11:30-13:30 (lab cyber.)
- 56 hours
 - 32 of theory
 - 24 of laboratory

Schedule

- See web site

Teaching aids

- Slides and scientific papers
 - On the web site
 - Books
 - G. Coulouris, et al, “Distributed systems. Concepts and designs”, Pearson, 5th ed, 2012
 - A. Tanenbaum, A.S. Van Steen, “Distributed Systems: Principles and Paradigms”, Prentice-Hall
 - A. Tanenbaum, “Disitributed Operating Systems ”, Prentice-Hall
 - M. Buttazzo, “Hard Real-Time Computing Systems”, Kluwer Academic Publishers
 - J.W.S. Liu, “Real-Time Systems”, Prentice Hall
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- DOS**
- RTOS**

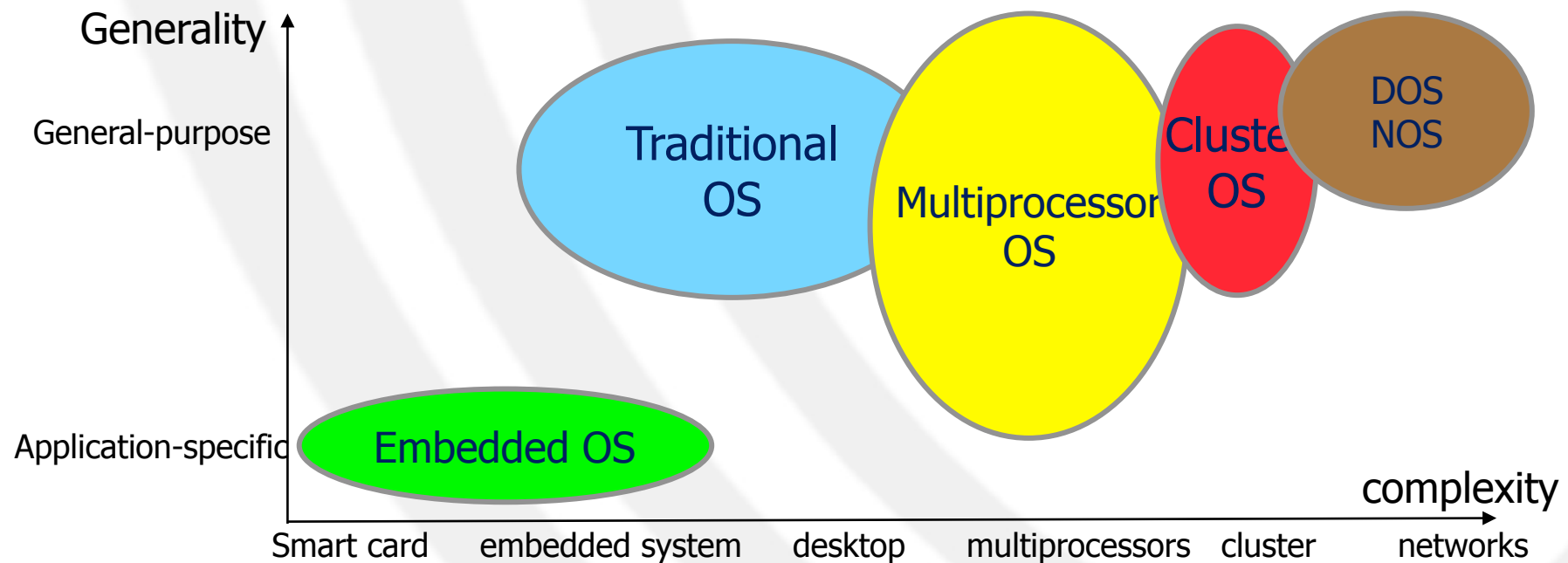
Exam

- Written test
 - Questions and exercises
 - Max 30/30 (laude only with lab project)
- Lab project (optional)
 - Groups of 2 or 3 people
 - Max 4 points
- When passed ... 6 CFU

Introduction

Space of operating systems

- Dimensions
 - Complexity of the host system
 - Generality of the host system



Real-time = further dimension!

Space of operating systems

- Multiprocessor OS
 - Not so different from traditional OS
- Distributed OS
 - Remote resources are not logically separated from local resources
 - Local resources access = remote resources access
- Cluster OS
 - For not much heterogeneous hosts without shared memory

Space of operating systems

- Network OS
 - Logical separation of remote resources (client/server model)
 - Local resources access \neq remote resources access
- Embedded OS
 - For application specific systems
 - Constraints on size, power, ...
- Real time OS
 - Orthogonal to OS categories
 - For monitoring system applications
 - Constraints on response time