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Manchester Metropolitan University

Advanced Operating Systems

Highlighting the examinable material

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An Overview on OS

- Process management
  - The different states (New, Ready, Running, …)
- CPU Scheduling Algorithms
  - (See lab exercises and slides)
  - FCFS, SJF, SRT and RR
- Memory management

Concurrency

- Processes & threads
- Race conditions, Critical sections (& related labs)
- Mutual exclusions & synchronisation
  - Semaphores, mutexes and monitors
  - Dekker's algorithm (see related lab)
- Deadlock (See related labs as well)
  - Deadlock conditions
    - Resource Allocation Graph (RAG)
  - Deadlock solutions

Cloud Computing

- Pros and Cons of Cloud Computing
- Essential characteristics
- Types of cloud deployment
- Different service models
  - Iaas, Pass and Saas
- Traditional OS vs. Cloud OS
- Fog and Mist computing

Distributed File Systems

- Why Distributed File Systems (DFS)?
- DFS requirements
- NFS, AFS and NTFS
- Distributed file systems for "Big Data"
  - GFS vs. HDFS

Virtual Machines (Virtualisation)

- Reasons for virtualisation
- Virtual Machine Monitor (VMM)
- Approaches to virtualisation
  - simulation, instruction trapping, paravirtualisation, hardware assisted virtualisation
- Performance issues in virtualisation

Fault Tolerance

- What *is* fault tolerance? (Definitions)
  - Dependability
- Reasons for failure
- Mechanisms for ensuring fault tolerance
- Recovery

Exam

- Two parts (OS & Networks)
  - For OS: three questions, answer two
    - Each question covers several topics
    - Sample questions with typical answers coming soon
      - Will be on Moodle