



Terminology

**What is a Program? What is a Process?
What is a Thread?**

Q

Terminology

What are the roles of the scheduler and the dispatcher?

Q

Terminology

**Compare the long term scheduler
to the short term scheduler.**

Q

Scheduling

Describe 3 properties related to process and thread control objects.

Q

Scheduling

Describe 3 properties related to the CPU context.

Q

Scheduling

Outline the sequence of a context switch as performed by the dispatcher.

Q

Scheduling

Compare cooperative to preemptive scheduling.

Q

Scheduling

What is a quantum? What effect does the length of a quantum have on the scheduler performance?



Scheduling

Threads can have different states in relation to scheduling. Draw a diagram and describe the purpose of the states and their transitions.

Q

Scheduling

When are scheduling decisions made?

Q

Scheduling

What are the optimization criteria of a scheduler?

Q

Scheduling

Draw a FIFO Gantt Chart for the given taskset.

Thread	Arrival Time	Burst Time
T_1	0	8
T_2	2	6
T_3	2	6
T_4	4	10

Assume that a context switch takes no time.

Q

Scheduling

Draw a Round Robin Gantt chart for the given taskset.

Thread	Arrival Time	Burst Time
T_1	0	8
T_2	2	6
T_3	2	6
T_4	4 + 0	10

**Assume that a context switch takes no time,
and use a quantum of length 3**

Q

Scheduling

Draw a Round Robin Gantt chart for the given taskset.

Thread	Arrival Time	Burst Time	Priority
T_1	0	8	9
T_2	2	6	11
T_3	2	6	10
T_4	4	10	11

**Assume that a context switch takes no time,
and use a quantum of length 3**

Q

Scheduling

For the example schedules above, calculate for each thread the waiting time and the turnaround time, as well as the throughput of the scheduler. Compare the numbers.

Q

Scheduling

Describe the problem of thread starvation in relation to priority schedulers.

Q

Scheduling

What is a multilevel queue scheduler? Linux and Windows both contain multilevel queue schedulers. Name an example for a queue level and describe what properties threads in this queue have.

Q

API

Name 2 functions related to process or thread creation.

Name 2 functions related to process or thread termination.

Q

API

Compare the Linux semantics of process creation (fork /exec) to the windows semantics of process creation (CreateProcess).

Q

API

What are the advantages and disadvantages of multithreading in a program?

Q

scheduling

**Compare User Mode Threads to
Kernel Mode Threads.**

When would you use which?

Q

terminology

What are Fibers?

- a) User Mode Threads on Windows
- b) The Windows equivalent of UNIX pipes
- c) Units of time counted in the Linux Kernel
- d) users in a traditional UNIX system

Q

terminology

What are cgroups?

- a) groups of capabilities of an executable
- b) groups of redundant file system entries
- c) isolated process control groups in Linux
- d) groups of users in Windows

Q

terminology

Describe the specific challenges of real-time scheduling. What is the difference between soft and hard real-time?

Q

scheduling

Describe one of the three discussed approaches of starvation avoidance.

Q

scheduling

What is priority inversion?

Q

scheduling

Which of the following is not a queue level in the Completely Fair Scheduler (CFS)?

- a) SCHED_BATCH
- b) SCHED_HIGH
- c) SCHED_RR
- d) SCHED_FIFO

Q

scheduling

Describe the concept of niceness in relation to the Linux Completely Fair Scheduler (CFS).

Q

scheduling

**What is thread affinity?
Compare hard affinity and soft affinity.**

Q

scheduling

On a high level, outline the similarities and differences of the Windows and Linux Scheduler.

Q

What?

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