

# CS 314 Operating Systems, Spring 2024

## Quiz #11 on April 25, 2024

### List of the Possible Questions (**SUGGESTIONS**)

- #1: What are “real-time systems”?
- #2: What is “hard real-time” system? What is “soft real-time system”?
- #3: What is “determinism”?
- #4: What is “responsiveness”?
- #5: What make “determinism” hard to guarantee (mention two)?
- #6: What make “responsiveness” hard to guarantee (mention two)?
- #7: In many real-time process scheduling algorithms, determinism and responsiveness are in a trade-off relationship. Describe how they are in a trade-off relationship.
- #8: What is “static real-time scheduling”?
- #9: What is “dynamic real-time scheduling”?
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- #10: What is “process migration” (how is it different from “process cloning”)? Make sure to describe its primary purpose.
- #11: What is “process cloning” (how is it different from “process migration”)? Make sure to describe its primary purpose.
- #12: What are the primary advantages and disadvantages in “process cloning” (compared with “process migration”)?
- #13: What are the primary advantages and disadvantages in “process migration” (compared with “process cloning”)?
- #14: What are the three essential decision-making factors for code migration and cloning?
- ~~#15: Mention three different actual metrics popularly used for “Transfer Policy”?~~
- ~~#16: Mention four different actual metrics popularly used for “Location Policy”?~~
- #17: What is “process migration delay”?
- #18: What does “migrated execution time” consist of (mention three components)?

**#19:** Which of followings can “process migration” migrate?

- (a) Program codes (can)
- (b) Program data (can)
- (c) Local resources (can not)

**#20:** Which of followings can “process cloning” migrate?

- (a) Program codes (can)
- (b) Program data (can)
- (d) Local resources (can not)

**#21:** What are “push-model migration/cloning” and “pull-model migration/cloning”?

- In the push-mode, each host computer can make a request to (other) remote host computers for help (i.e., running programs) instead of waiting for an offer for helps from other remote host computers. This can offer quick responses for help when a computer needs help from other remote host computers.

**Note:** just one advantage is enough.

**#22:** What are the primary advantages in “pull-model migration/cloning” (compared with “push-model”)?

- In the pull-mode, remote host computers that have extra computing resources to help other host computers make requests (i.e., offers for helping other host computers). Therefore, it more likely happens that the best remote host computers (i.e., those that are least utilized) can help other host computers.

**Note:** just one advantage is enough.

**#23:** What is “weak mobility” (make sure to mention the **one** key difference from “strong mobility”)?

**#24:** What is “strong mobility” (make sure to mention the **one** key difference from “weak mobility”)?

**#25:** What is the primary advantage and disadvantage in “strong mobility” (compared with “weak mobility”)?

In strong mobility, programs (and possible their data to be processed) can be transferred to a remote host computer any time (even after a program starts running). This offers flexibility.

**#26:** What is “internal execution”?

**#27:** What is “external execution”?

**#28:** What is the primary advantage in “external execution” (compared with “internal execution”)?

External execution executes programs faster than the internal execution (i.e., there is no overhead from a VM (virtual machine execution)).