Commencé le	Monday 16 December 2024, 10:00
État	Terminé
Terminé le	Monday 16 December 2024, 10:38
Temps mis	37 min 51 s
Points	15,73/33,00
Note	**9,54** sur 20,00 (**47,68**%)

Question **1**

Incorrect

Note de 0,00 sur 1,00

When accessing an illegal address from a user process...

- [ ] a. The CPU sends a Page fault to your kernel
- [x] b. The CPU sends a SIGSEGV to the kernel ✖
- [x] c. The kernel sends a Page Fault to the process ✖
- [ ] d. The CPU sends a SIGSEGV signal to the process
- [ ] e. The CPU sends a Page Fault to the process
- [ ] f. The kernel sends a SIGSEGV signal to the process

Les réponses correctes sont : The kernel sends a SIGSEGV signal to the process, The CPU sends a Page fault to your kernel

Question **2**

Partiellement correct

Note de 0,50 sur 1,00

The kernel is a process that is always running. Another process can run...

- [x] a. concurrently to the kernel even on the same CPU/core because the CPU constantly switches between kernel and user mode ✔
- [ ] b. only if the computer has at least two CPUs or cores
- [x] c. in parallel to the kernel even on the same CPU/core ✖

La réponse correcte est : concurrently to the kernel even on the same CPU/core because the CPU constantly switches between kernel and user mode

Question **3**

Correct

Note de 1,00 sur 1,00

What happens if a hardware interrupt is emitted while a user process is active?

- a. All other interrupts are masked to prevent another interrupt from interrupting this interrupt handler.
- b. The user process is asked by a signal to yield in favor of the kernel.
- c. The user process is interrupted and the interrupt is handled in kernel space. ✔
- d. The interrupt will be handled after the next timer interrupt.

La réponse correcte est : The user process is interrupted and the interrupt is handled in kernel space.

Question **4**

Correct

Note de 1,00 sur 1,00

Select the correct affirmations.

- a. User root has the same privileges as the kernel
- b. Kernel can not be infected thanks to user / kernel separation
- c. As they are older and heavier, monolithic kernels tend to be slower than microkernels
- d. Ring 2 has more privileges than Ring 3 ✔

La réponse correcte est : Ring 2 has more privileges than Ring 3

Question **5**

Correct

Note de 1,00 sur 1,00

When I press a key on the keyboard, it triggers

- a. A software interrupt
- b. A hardware interrupt ✔
- c. A signal

La réponse correcte est : A hardware interrupt

Question **6**

Correct

Note de 1,00 sur 1,00

What services does the kernel provide?

- a. Device drivers ✔
- b. Memory management ✔
- c. System calls ✔
- d. Memory allocation ✔

Les réponses correctes sont : Device drivers, Memory management, Memory allocation, System calls

Question **7**

Partiellement correct

Note de 0,50 sur 1,00

Which of the following events results in a software interrupt?

- a. A division by zero ✔
- b. An access to a nonexistent memory page ✔
- c. An I/O event ✖
- d. Data that is moved from memory to L1 cache

Les réponses correctes sont : A division by zero, An access to a nonexistent memory page

Question **8**

Correct

Note de 1,00 sur 1,00

The ELF file has the exact same structure for 32-bit and 64-bit architectures.

Veuillez choisir une réponse.

- Vrai
- Faux ✔

La réponse correcte est « Faux ».

Question **9**

Partiellement correct

Note de 0,50 sur 1,00

Select the correct affirmations.

- [ ] a. Dynamic linking occurs at run time
- [ ] b. Static executables are more secure
- [x] c. Static ELF is more portable than dynamic ELF ✔

Les réponses correctes sont : Static ELF is more portable than dynamic ELF, Dynamic linking occurs at run time

Question **10**

Incorrect

Note de 0,00 sur 1,00

The Program Header in an ELF file points to...

- [ ] a. Possibly both -- ELF Section and Segment
- [ ] b. An ELF Segment
- [x] c. An ELF Section ✖
- [ ] d. None of the other answers is correct.

La réponse correcte est : An ELF Segment

Question **11**

Terminé

Non noté

Write-up

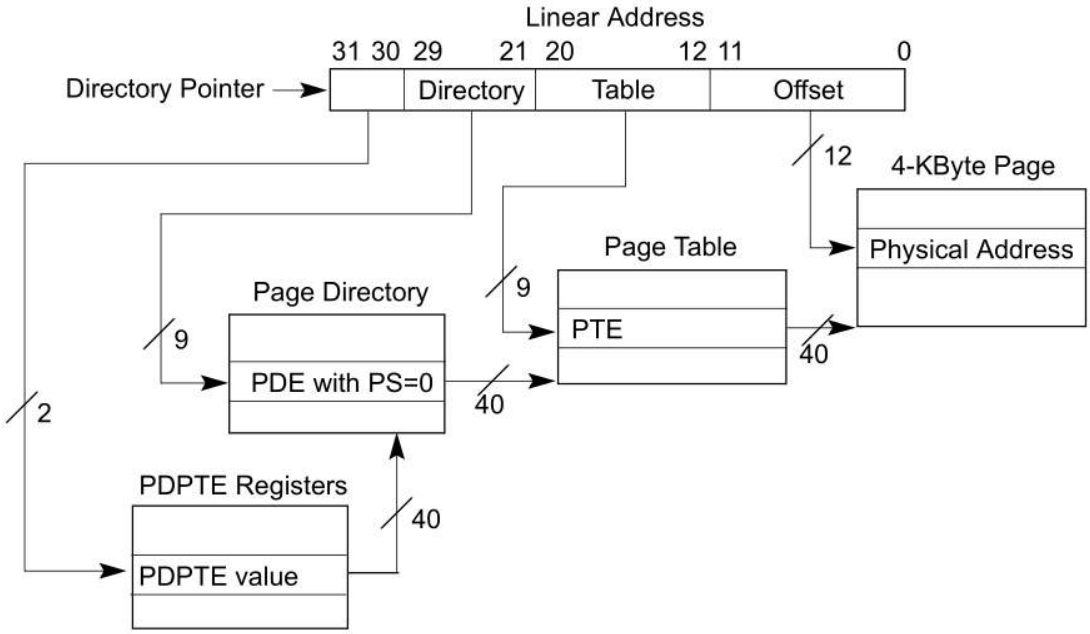
Explain paging process when the PAE feature is enabled. Your write-up must contain at least :

- The theoretical virtual address space size (use the proper units in the IEC notation).

- The theoretical physical address space size (use the proper units in the IEC notation).

- What's the purpose of PAE? How? What are it's limitations?

You must justify your answers.



Edit the following....
 When PAE is enabled, considering a given address in 32 bits the decoding process is complex
 - Virtual address space size : 2^32 addresses - Physical address space size : Depends on the machine - The limitations of PAE on a 32-bit system are : It is slow

Question **12**

Partiellement correct

Note de 1,50 sur 3,00

Consider a 32 bit x86 CPU architecture (without PAE) and a page size of 4KiB. This is the page directory:

Page Directory

0x0	0xADDED
0x1	0xCAFE
0x2	0xFACE
⋮	⋮
0x5	0xFADED
⋮	⋮
0x150	0xABBA
⋮	⋮

Now consider the following page tables:

Page Tables

at frame	**0xADDED**	**at frame**	**0xCAFE**	**at frame**	**0xFACE**	**at frame**	**0xFADED**	**at frame**	**0xABBA**
0x0	0x0101	0x0	0x0201	0x0	0x0301	0x0	0x0401	0x0	0x0501
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
0x1	0x0102	0x1	0x0202	0x1	0x0302	0x1	0x0402	0x1	0x0502
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
0x3	0x0103	0x3	0x0203	0x3	0x0303	0x3	0x0403	0x3	0x0503
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
0x43	0x0104	0x43	0x0204	0x43	0x0304	0x43	0x0404	0x43	0x0504
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
0x10C	0x0105	0x10C	0x0205	0x10C	0x0305	0x10C	0x0405	0x10C	0x0505
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
0x143	0x0106	0x143	0x0206	0x143	0x0306	0x143	0x0406	0x143	0x0506
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
0x321	0x0107	0x321	0x0207	0x321	0x0307	0x321	0x0407	0x321	0x0507
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
0x543	0x0108	0x543	0x0208	0x543	0x0308	0x543	0x0408	0x543	0x0508
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

Note: All responses have to be given as a number to base 16 with prefix 0x.

Question 1

In which frame (to base 16) is the corresponding page table for the virtual address 0x543210?

This question is worth **1 points**.

Answer : 0xCAFE ✔

Question 2

Which physical frame (to base 16) contains the virtual address 0x543210?

This question is worth **1 points**.

Answer : 0x143 ☑

Question 3

What is the physical address (to base 16) corresponding to the virtual address 0x543210?

This question is worth **1 point**.

Answer : 0x0206 ✖

Question **13**

Incorrect

Note de 0,00 sur 1,00

The mapping of new pages into your address space takes place...

- a. when you do a write memory access ✔
- b. when you call mmap(2) ✖
- c. when you do a read memory access
- d. when you call malloc(3)

Les réponses correctes sont : when you do a read memory access, when you do a write memory access

Question **14**

Incorrect

Note de 0,00 sur 1,00

Segmentation can lead to external fragmentation

Veuillez choisir une réponse.

- Vrai
- Faux ✖

La réponse correcte est « Vrai ».

Question **15**

Partiellement correct

Note de 0,33 sur 1,00

CR3...

- a. ...is set by the kernel ✔
- b. ...holds all page mappings directly
- c. ...points to the root node of the paging structures used by your CPU
- d. ...is modified each time you context switch to another process' task
- e. ...can be changed by a process

Les réponses correctes sont : ...points to the root node of the paging structures used by your CPU, ...is modified each time you context switch to another process' task, ...is set by the kernel

Question **16**

Correct

Note de 1,00 sur 1,00

What is the most direct way for a user process to ask the kernel for more memory?

- a. calloc(3)
- b. malloc(3)
- c. fork(2)
- d. mmap(2) ✔
- e. morememem(2)

La réponse correcte est : mmap(2)

Question **17**

Incorrect

Note de 0,00 sur 1,00

When a page is swapped out ...

- a. When a user process accesses the page afterwards, it receives the signal SIGSEGV ✖
- b. The page table entry is marked as invalid ✔
- c. The page table entry points to the address in the backing store
- d. The page is copied to the backing store

Les réponses correctes sont : The page table entry is marked as invalid, The page is copied to the backing store

Question **18**

Correct

Note de 1,00 sur 1,00

On a system using paging, user processes manipulate virtual addresses?

Veuillez choisir une réponse.

- Vrai ✔
- Faux

La réponse correcte est « Vrai ».

Question **19**

Partiellement correct

Note de 0,75 sur 1,00

The TLB...

- [x] a. ...is completely flushed on write memory access ✖
- [x] b. ...is a CPU cache ✔
- [x] c. ...is completely flushed by writing to CR3 ✔
- [ ] d. ...is filled by your kernel
- [ ] e. ...is a paging structure
- [ ] f. ...is never flushed

Les réponses correctes sont : ...is a CPU cache, ...is completely flushed by writing to CR3

Question **20**

Partiellement correct

Note de 0,33 sur 1,00

I/O bound tasks
have long ✖ CPU bursts and short ✖ I/O operations.

CPU bound tasks
have short ✖ CPU bursts and long ✖ I/O operations.

Interactive systems should assign
higher priority ✔ to I/O bound tasks
and lower priority ✔ to CPU bound tasks.

short long

Your answer is partially correct.

Vous en avez sélectionné correctement 2.
La réponse correcte est :
I/O bound tasks
have [short] CPU bursts and [long] I/O operations.

CPU bound tasks
have [long] CPU bursts and [short] I/O operations.

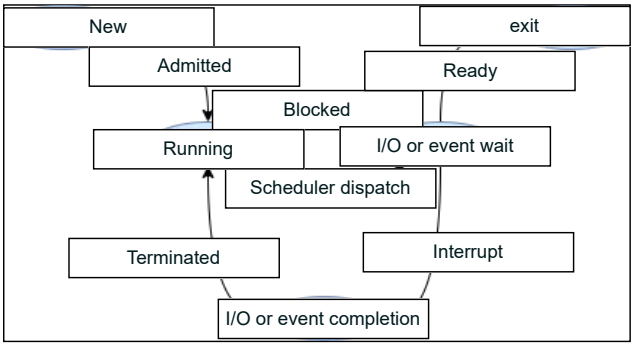
Interactive systems should assign
[higher priority] to I/O bound tasks
and [lower priority] to CPU bound tasks.

Question **21**

Partiellement correct

Note de 0,82 sur 3,00

Fill the schema with the different scheduling states of a task and the transitions



Your answer is partially correct.

Vous en avez sélectionné correctement 3.

Question **22**

Incorrect

Note de 0,00 sur 1,00

When a task blocked for an I/O event, upon completion of the event, the task goes back into...

- a. The running queue
- b. The completion queue
- c. The ready queue
- d. The wait queue ✖

La réponse correcte est : The ready queue

Question **23**

Partiellement correct

Note de 0,17 sur 1,00

Which of the following statements are correct?

- [x] a. Processes are organized as a tree ✔
- [ ] b. Processes always have a parent process (except the one with PID 1: init)
- [ ] c. A process has only one thread
- [x] d. A process can be viewed as a group of thread ✔
- [x] e. Processes can share registers with other processes ✖

Les réponses correctes sont : A process can be viewed as a group of thread, Processes always have a parent process (except the one with PID 1: init), Processes are organized as a tree

Question **24**

Partiellement correct

Note de 0,50 sur 1,00

Which of the following statements are correct?

- [x] a. Linux uses multiple priority queues ✔
- [x] b. Round-Robin (RR) with small time quantum has smaller context switch overhead ✖
- [x] c. Response time of RR is shorter than of FCFS ✔
- [ ] d. Completely Fair Scheduling results in high response times

Les réponses correctes sont : Response time of RR is shorter than of FCFS, Linux uses multiple priority queues

Question **25**

Partiellement correct

Note de 0,50 sur 1,00

A directory on a filesystem...

- [ ] a. is part of the file's metadata
- [ ] b. translates file names to inode numbers
- [x] c. is just another file ✔
- [ ] d. None of the other answers is correct

Les réponses correctes sont : is just another file, translates file names to inode numbers

Question **26**

Incorrect

Note de 0,00 sur 1,00

Which of the following statements are correct?

- a. A soft link maps a file name to an inode ✖
- b. Hard links can link to files on a different filesystems
- c. A hard link maps a file name to another file name ✖
- d. None of the other answers are correct

La réponse correcte est : None of the other answers are correct

Question **27**

Incorrect

Note de 0,00 sur 1,00

When we say everything is a file on Unix, we mean

- a. everything is actually a file ✖
- b. everything is abstracted through file-like objects

La réponse correcte est : everything is abstracted through file-like objects

Question **28**

Correct

Note de 1,00 sur 1,00

A file descriptor...

- a. ...always represents a file on a block device
- b. ...is the index of an entry in the process' File Descriptor Table ✔
- c. ...represents objects on which we can use file-like operations ✔
- d. Entries in the per-process file descriptor table point to the system-wide open-file table ✔

Les réponses correctes sont : ...is the index of an entry in the process' File Descriptor Table, ...represents objects on which we can use file-like operations, Entries in the per-process file descriptor table point to the system-wide open-file table

Question **29**

Partiellement correct

Note de 0,33 sur 1,00

What of the following is true about the VFS?

- a. Named pipes are abstracted as file-like objects in Linux
- b. System calls are abstracted as file-like objects in Linux
- c. The behaviors of the read and write system calls depend on the respective file type ✔
- d. Partitions are abstracted as file-like objects in Linux

Les réponses correctes sont : Named pipes are abstracted as file-like objects in Linux, Partitions are abstracted as file-like objects in Linux, The behaviors of the read and write system calls depend on the respective file type

Question **30**

Correct

Note de 1,00 sur 1,00

Does the inode contain the file name?

Veuillez choisir une réponse.

- Vrai
- Faux ✔

La réponse correcte est « Faux ».

◄ 1 - Processes & Memory

Aller à...