Operating Systems
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S05

AssistantArgs* args = arguments;

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Exercise 2

Total memory : 2^{32} Bytes.
Page size : $8192 = 2^{13}$ Bytes.
Entries : $2^{32}/2^{13} = 2^{32-13} = 2^{19} = 524'288$ entries.
Time needed to load the page table : $10^{-9} \cdot 100 \cdot 524'288 = 0.052 = 52$ ms.
If a process get 100 msec, then 52% of the time is spent on loading page tables.

Exercise 3

Page size : $32 - 11 - 9 = 12$ and $2^{12} = 4096 = 4$ KB. Number of pages : $9 + 11 = 20$ and 2^{20} number of pages is available.

Exercise 4

1)

Because the TLB is an hardware device, an entry in the TLB can be overwritten because changes are save to the memory directly and not in the TLB.

2)

When the modified bit of a TLB is changed to 1. The modification has to be written in the page table entry in memory.

3)

There are two situations : the TLB context have to be reloaded on every context switch and the other from the previous answer.

Exercise 5

See attachment.