Homework 5 – CS 0449

Question 1: With an inverted page table, and physical memory that is 4 GiB in size, and pages that are 2KiB in size, how large is the page table in terms of page entries?

A: 2 Gi B: 2 Ki C: 1 Ki D: 0.5 Ki

E: 2 Mi F: 4 Ki G: 0.5 Gi H: 782 Ki

?

Answer:

Question 2: With a multi-level page table with two levels, 32-bit addresses, and a page size of 1 KiB, how many entries are in the individual page tables, if they are all the same size?

A: B: C: D:

E: F: G: H:

?

Answer:

Question 3: To avoid a buffer overflow from being an effective security issue when a malicious actor uses one to inject code into a program, what is one possible strategy that could be used?

A: mark stack segment “read-only” B: mark stack segment as “non-execute”

C: mark code segment “writable” D: place data segment in high memory

Answer:

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Consider the following (normal) page table and translate the addresses that follow.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Valid** | **Write** | **Execute** | **Physical Address** |
| 0000 | 1 | 0 | 1 | e2f3 |
| 0001 | 0 | 0 | 0 | 0000 |
|  | ... | ... | ... | ... |
| aff0 | 0 | 0 | 0 | c233 |
| aff1 | 1 | 1 | 0 | b3d8 |
| aff2 | 0 | 0 | 0 | 0000 |
|  | ... | ... | ... | ... |
| fffc | 0 | 0 | 0 | 563c |
| fffd | 1 | 0 | 1 | 563b |
| fffe | 1 | 0 | 0 | aff1 |
| ffff | 1 | 0 | 0 | af3d |

Question 4: 0xaff1563b

A: 0xc233563b B: 0xb3d8aff1 C: 0xb3d8563b D: page fault

?

Answer:

Question 5: 0xfffc1240

A: 0x563c1240 B: 0xfffcaff1 C: 0xfffc1240 D: page fault

Answer:

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Submission:

Please modify this document and answer in the provided spaces and submit your completed document as a PDF to Gradescope. You may write in your answers and scan them in. Or carefully modify this document in Word and export to PDF.