

CS162, Spring 2004
Section 8 Quiz 1
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Directions: Complete the following questions as best you can. You're encouraged to discuss these questions with the people around you. This quiz IS NOT GRADED. Its only intended to help you understand the material.

1. Assume a runtime environment with 16-bit address that accesses a larger memory. The upper four bits name a page, the lower twelve bits provide an offset in a page. Here is a snapshot of a page table in this system:

Page	Value	Valid
0	0x14	Y
1	0x50	Y
2	0x52	Y
3	0xFE	N
4	0xA4	Y
5	0x26	Y
6	0x88	Y
7	0x68	Y
8	0xD4	N
9	0x18	Y

Given the page table above, translate the following addresses. If there is any sort of error, explain why.

- a. 0x156D =
- b. 0x6400 =
- c. 0xB916 =
- d. 0x8888 =
- e. 0x7888 =
- f. 0x23F4 =
- g. 0x3A6B =

Answers:

- a. $0x156D = 0x5056D$
- b. $0x6400 = 0x88400$
- c. $0xB916 = \text{Not shown in table.}$
- d. $0x8888 = \text{Page fault.}$
- e. $0x7888 = 0x68888$
- f. $0x23F4 = 0x523F4$
- g. $0x3A6B = \text{Page fault.}$

2. What does using a TLB add to context switches?

Remember that each process typically has its own page tables. Therefore, we need to invalidate all the entries in TLB (flush TLB) on a context switch.

This is a big part of why process context switches are costly. Can you think of a hardware fix to this?