CSci 144 Introduction to Operating Systems

Quiz 1, September 13, 2017

1. What are the three key roles of an operating system? Which role does *virtual memory* provide?

   Refer to Page 7.

   Referee, Illusionist, and Glue.

   Virtual memory is an example of Illusionist: the computer system has infinite amount of physical memory.

2. When a process is running on the processor in kernel mode – due to an interrupt, processor exception or system call, what does its kernel stack contain?

   Refer to Page 66, Figure 2.9, then bullet #2 at the end of the page.

   In this case, the kernel stack is in use, containing the saved registers from the suspended user-level computation as well as the current state of the kernel handler.

3. Please list at least two desirable features *physically addressed base and bound registers* do not provide.

   Refer to Page 51-52.

   - Expandable heap and stack
   - Memory sharing
   - Physical memory addresses
   - Memory fragmentation

4. What is interrupt masking? What's the reason of having interrupt masking?

   Refer to page 67, first 2 paragraphs of section 2.4.4.

   Definition: interrupts are disabled during the handling of the existing interrupt and re-enabled when the processing is done.

   Reason: if an interrupt handler is interrupted, it causes the race condition and further, we cannot set the stack pointer to point to the base of the kernel's interrupt stack – doing so would obliterate the state of the first handler.