CST 334: Operating Systems

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# OSTEP Chapter 15

**Purpose**. Modern computers translate virtual addresses to physical address while a program is running. The purpose of this assignment is to help you develop a better understanding of the most basic virtual memory approach, which is known as "base and bounds addressing", or "dynamic relocation".

**Instructions**. Please read OSTEP chapters 15, and answer the following questions by downloading and editing [chap15.txt](https://drive.google.com/file/d/1o_WNqZVsylPI3y6NgrNUA9lTy9lDSCul/view?usp=sharing).

1. Suppose we have a simple non-segmented virtual address space, where virtual addresses are 5 bits long. How big is the virtual address space? In other words, how many bytes can be addressed?

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1. Suppose we have a simple non-segmented virtual address space of 16K bytes. How many bits in a virtual address (assuming each byte is addressable) ?

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1. (T/F) In dynamic relocation, the base and bounds values are part of the process state.
2. (Y/N) In base and bounds addressing, can the base and bounds values for a process change during the lifetime of a process?
3. Suppose we are using base and bounds addressing. If the virtual address is 5321, the base register value is 100, and the bounds register value is 4500, then what is the corresponding physical address. (The values given are decimal values.)

fault

1. (T/F) A user process can change its own base and bounds values.
2. If a process attempts to access a memory location outside its own virtual address space, what is the result? 1) a trap 2) an exception

**Submitting.** Submit your edited chap15.txt on iLearn.

**Grading**. Each problem is worth 10 points.