Lecture08- Assignment

1. (4 Points) Consider the following segment table (shown in Table 1):

|  |  |  |
| --- | --- | --- |
| **Segment** | **Base** | **Limit** |
| 0 | 216 | 600 |
| 1 | 2300 | 20 |
| 2 | 90 | 100 |
| 3 | 1327 | 510 |

Table 1.

Calculate the ***physical address*es** (in decimal) of the following ***logical addresses***:

1.1. [1 point] 0, 430

1.2. [1 point] 1, 20

1.3. [1 point] 2, 511

1.4. [1 point] 3, 400

1. (3 Points) What is the purpose of paging the page tables? Describe the advantage(s) of inverted page table over direct page table.
2. (4 Points) Consider a virtual memory system with a page size of **128-bit** and a physical memory of **256 bytes**. Each logical address has a **4-bit** offset value. The **page table** is shown in Table 2.

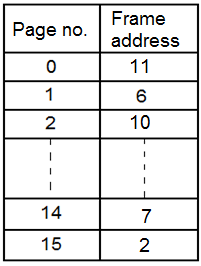


Table 2.

Based on the **page table**, calculate the ***physical address*es** (in decimal) of the following ***logical addresses***:

3.1. [1 point] 0116

3.2. [1 point] 2B16

3.3. [1 point] 1A16

3.4. [1 point] FC16

1. (4 Points) “Any attempt by a program executing in **user mode** to access operating-system memory or other users’ memory generates a **trap** to OS”. Briefly discuss how would the OS protect the memory accesses during the program execution?
2. What is *address binding*? Why is dynamic address binding more preferable in a computer system than static address binding?
3. Consider a computer with a **32-bit** virtual address (logical address) and a **4K-bit** page size. How many entries are required in a **page table**? If each page table entry requires **4 bytes**, what is the **total size** of the page table?