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FACULTY OF ENGINEERING & TECHNOLOGY

BCS-501 Operating System

Lecturer-26

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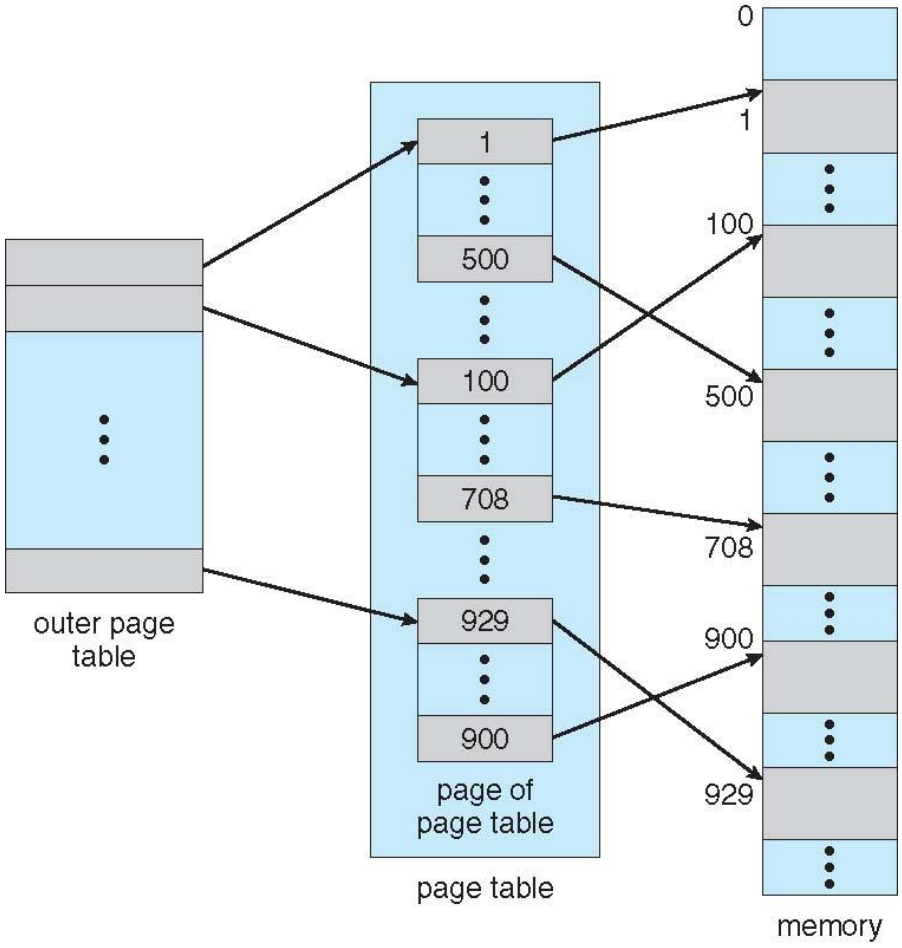
Paging Scheme

- Two-Level Page-Table Scheme
- Two-Level Paging Example
- Address-Translation Scheme
- 64-bit Logical Address Space

Two-Level Page-Table Scheme



Two-Level Paging Example

•A logical address (on 32-bit machine with 1K page size) is divided into:

- a page number consisting of 22 bits
- a page offset consisting of 10 bits

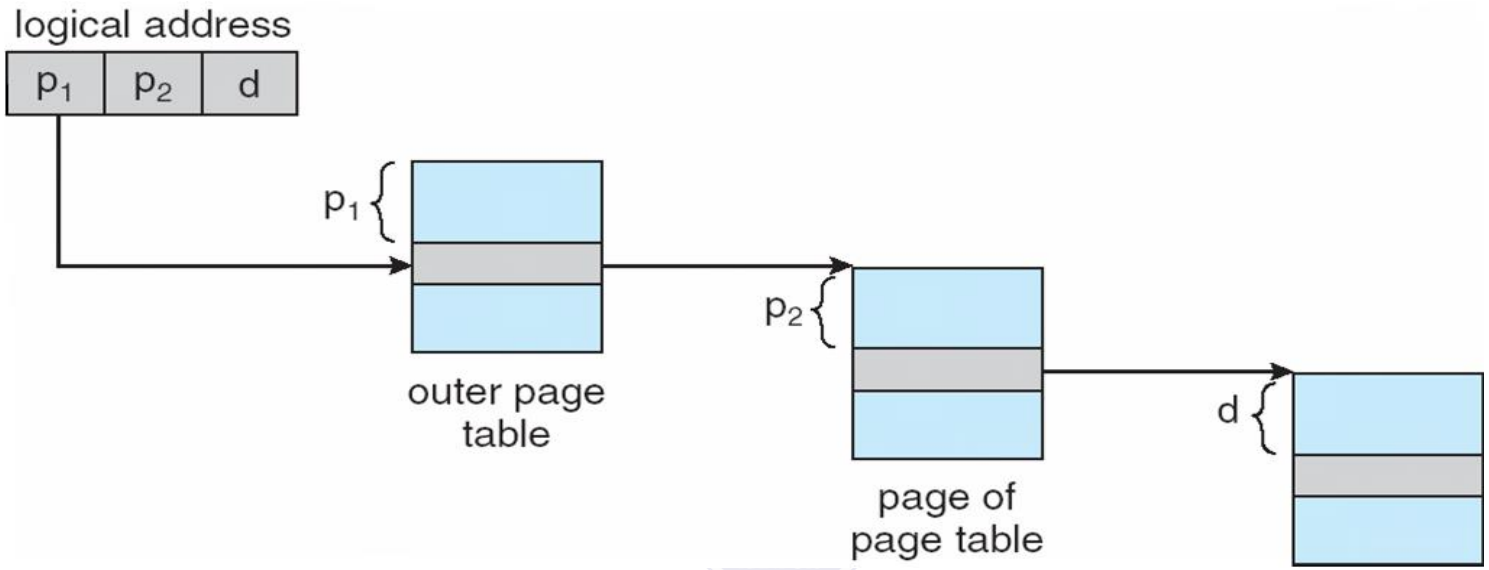
•Since the page table is paged, the page number is further divided into:

- a 12-bit page number
- a 10-bit page offset

Thus, a logical address is as follows:

•where p_1 is an index into the outer page table, and p_2 is the displacement within the page of the inner page table
Known as forward-mapped page table

Address-Translation Scheme



64-bit Logical Address Space

•Even two-level paging scheme not sufficient
•If page size is 4 KB (2^{12})

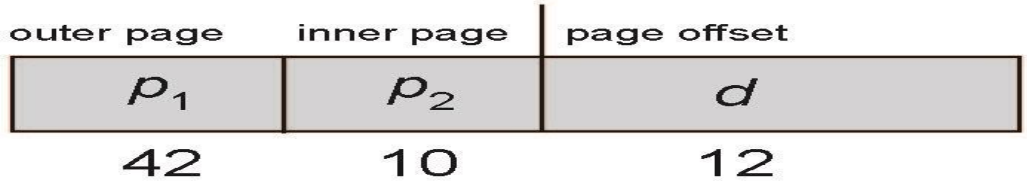
- ➢Then page table has 2^{52} entries
- ➢If two level scheme, inner page tables could be 2^{10} 4-byte entries
- ➢Address would look like

•Outer page table has 2^{42} entries or 2^{44} bytes

•One solution is to add a 2nd outer page table

•But in the following example the 2nd outer page table is still 2^{34} bytes in size

- ➢And possibly 4 memory access to get to one physical memory location



CONTINUE……

MCQ

What is contained in the page table?
A. Base address of each frame and corresponding page number
B. Memory address and corresponding page number
C. File name and corresponding page number
D. None of Above

The Banker's algorithm is used
A. to rectify deadlock
B. to detect deadlock
C. to prevent deadlock
D. to slove deadlock

Which of the following concept is best to preventing page faults?
A. Paging
B. The working set
C. Hit ratios
D. Address location resolution

A page fault occurs when

A. the Deadlock happens
B. the Segmentation starts
C. the page is found in the memory
D. the page is not found in the memory

Bringing a page into memory only when it is needed, this mechanism is called

A. Deadlock
B. Page Fault
C. Dormant Paging
D. Demand Paging