

Operating System: Paging: Introduction

By: Vishvadeep Gothi



VISHVADEEP GOTHI SIR

**AIR- 19, 119, 440, 682
in GATE**



**ME from IISc Bangalore
Mtech BITS Pilani in Data
Science**



**14+ Years of Teaching Experience,
10+ Years in GATE/IES**



Subjects Taken:
Computer Organization & Architecture,
data structure, operating system,
C-Programming, Data science,
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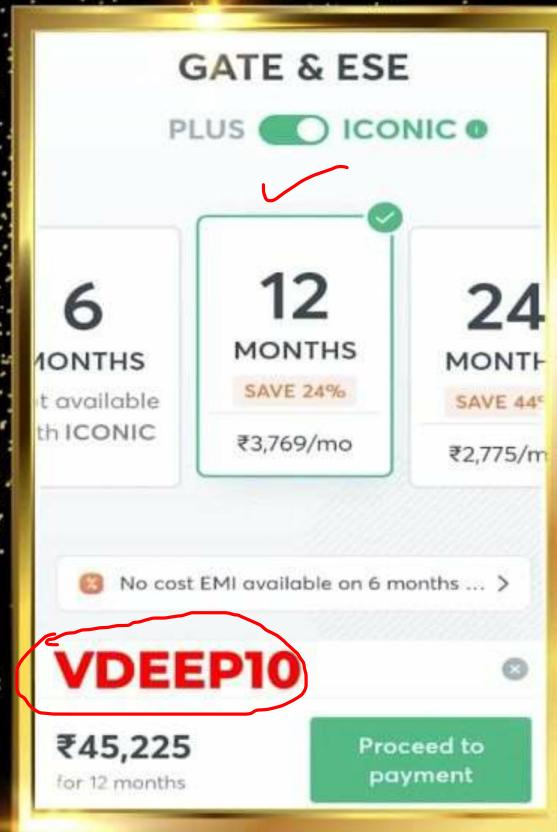
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Memory Management Techniques

Contiguous

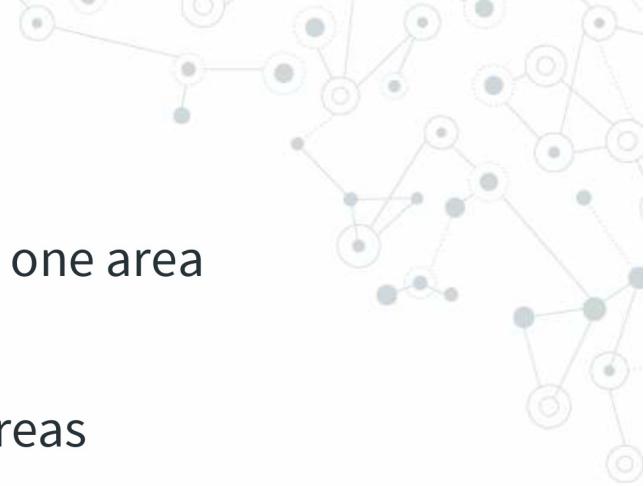
Non-contiguous

Non-Contiguous MMT



Non-Contiguous MMT

- ◎ Process is scattered in memory, not allocated at one area
- ◎ Two techniques:
 - Paging: Scattered in same size of memory areas
 - Segmentation: Scattered in variable size of memory areas



Paging

- Process is divided in equal size of pages
- Physical memory is divided in same equal size of frames
- Pages are scattered in frames



Paging: Example

Process

Page D
Page 1
Page 2
Page 3

4 pages

Page table

0	4
1	7
2	3
3	0

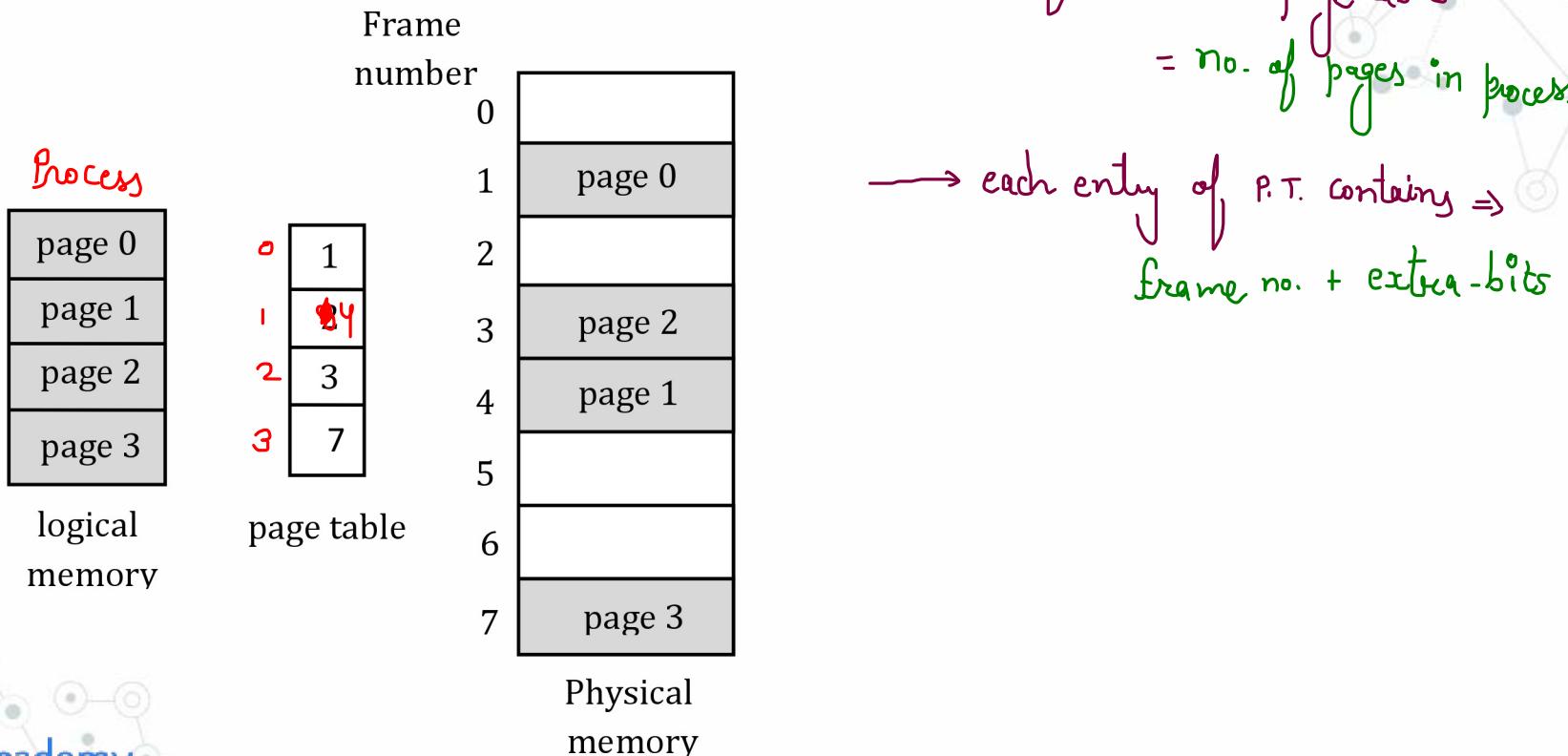
frame nos

Physical memory

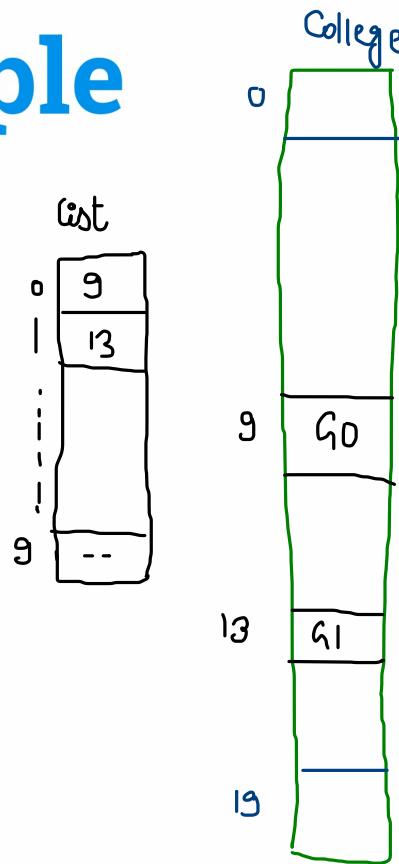
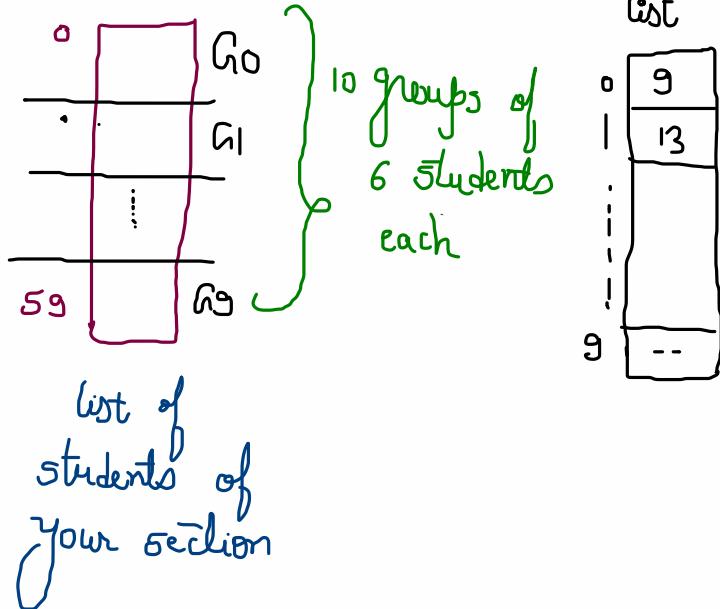
Page 3	frame 0
	1
	2
Page 2	3
Page 0	4
	5
	6
Page 1	7

8 frames

Paging: Example



Paging: Example



Paging: Example

$$\begin{aligned}\text{Page Table size} &= \text{No. of entries in P-T} * \text{1 entry size} \\ &= \text{No. of pages in process} * \text{1 entry size} \\ &= \underline{\quad} \parallel \underline{\quad} \parallel \underline{\quad} * (\text{Frame no. + extra-bits})\end{aligned}$$

Page table is also stored in mm, in form of pages.

Paging

- ✓ Process is divided in equal size of pages
- ✓ Physical memory is divided in same equal size of frames
- ✓ Processor will have a view of process and its pages
- ✓ Pages are scattered in frames
- ✓ Page table is used to map a process page to a physical frame



Paging

whenever CPU request a specific content,
↓

→ 2 times the physical memory
is accessed,

- one for page table
- one for content

1. find out content present in which page
2. Search P.T. & get the frame no. in which the page is stored.
3. Use that frame no. & get the content from that frame

Next Class

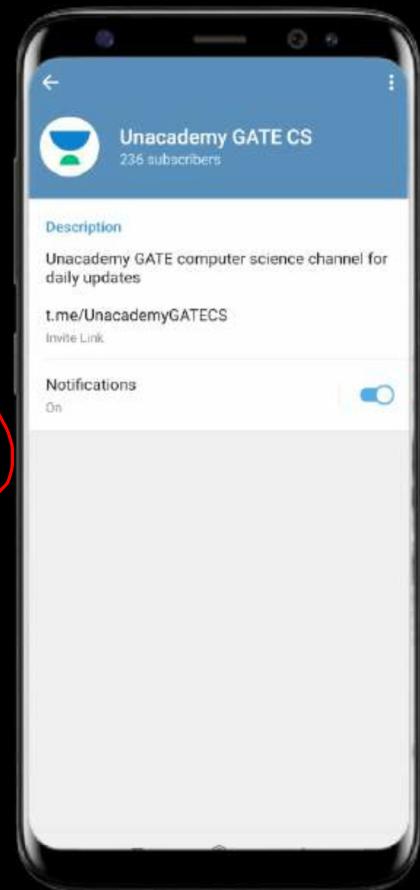
Address Translation in Paging



Logical & Physical Address



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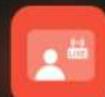
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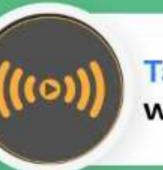
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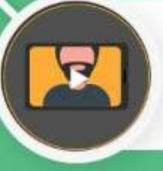
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