

Operating System: Paging: Address Translation

By: Vishvadeep Gothi



VISHVADEEP GOTHI SIR

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in GATE**



**ME from IISc Bangalore
Mtech BITS Pilani in Data
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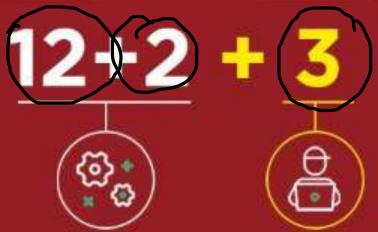
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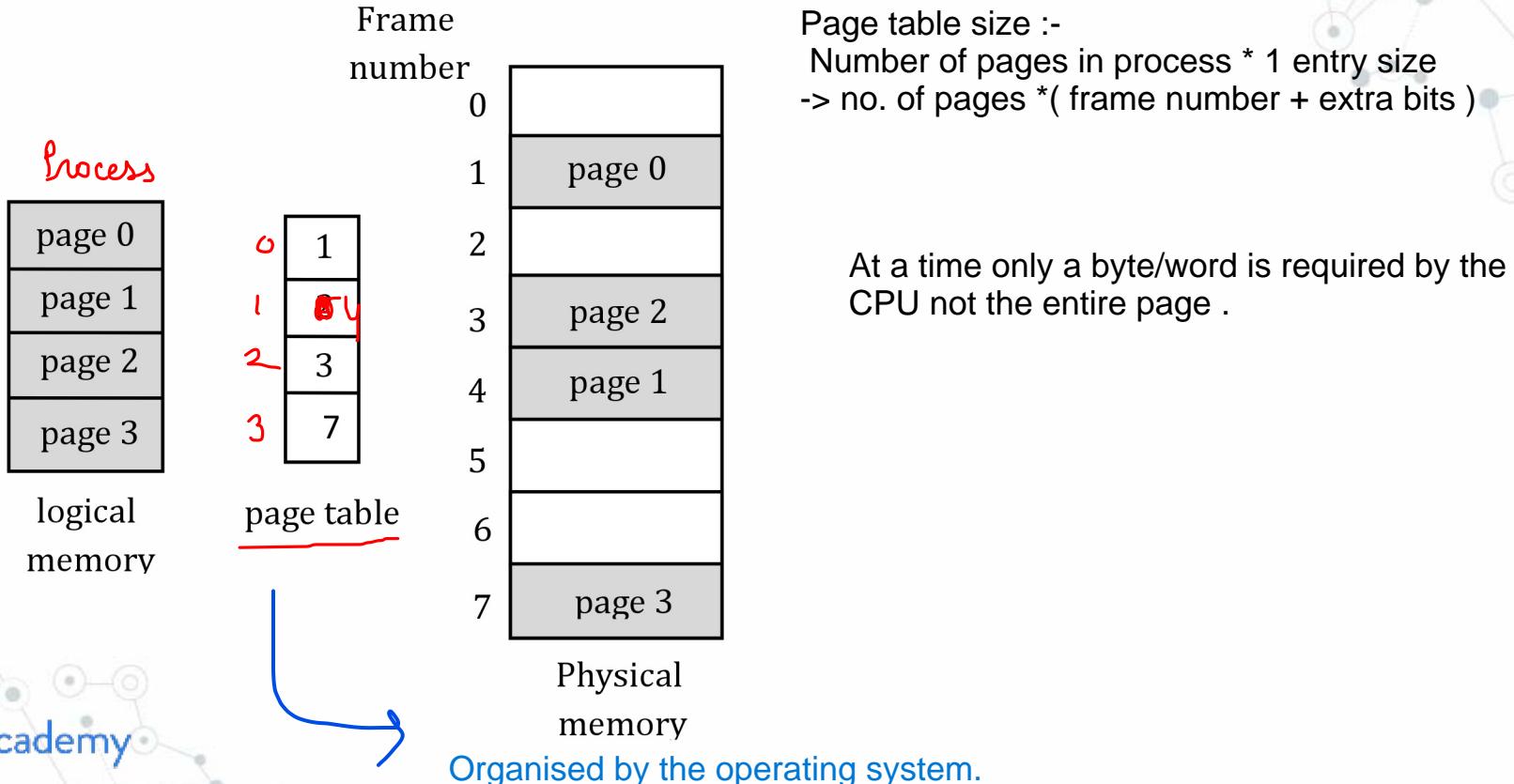


Paging - Scattered in same size of memory.

- 1.) Process is divided into equal sizes of pages.
- 2.) Physical memory is divided into same equal size of frames .
- 3.) Pages are scattered in frames .

Segmentation - Scattered in variable of memory .

Paging: Example



Paging

Page size = 2 bytes

Process size = 4 pages = $4 * 2B = 8B$

Physical mem size = 8 frames = $8 * 2B = 16B = \underline{\underline{2^4B}}$

physical mem.
add. = 4-bits

Paging

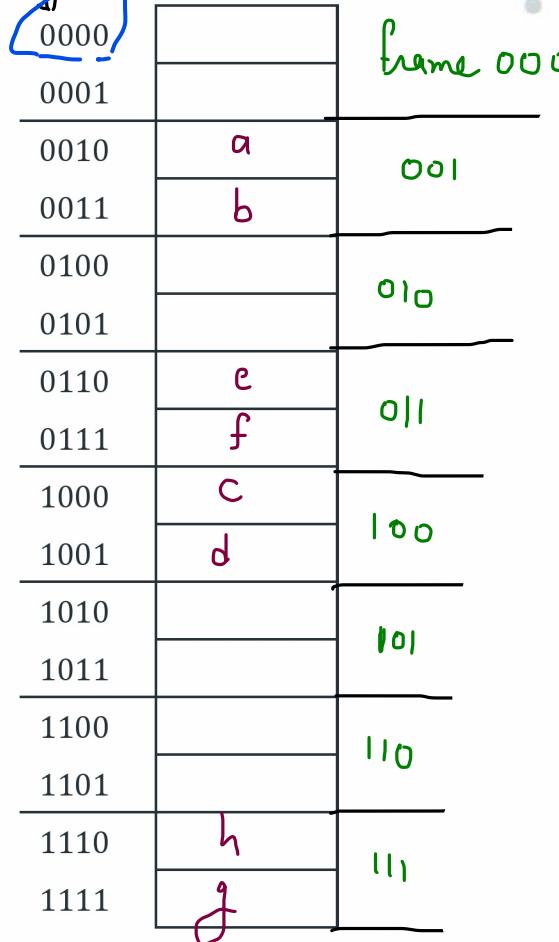
Provided by the OS.

Logical address
↓
Page no.

Process	Page no.
a	00
b	00
c	01
d	01
e	10
f	10
g	11
h	11

Page Table
001
100
011
111

addressed
Physical Memory
byte number
frame number



Paging

CPU always generates logical addresses

logical add.

Page no.	byte no.
p	d

bits for page no. = \log_2 (no. of pages in process)

bits for byte no.
(line no.) = \log_2 (Page size)

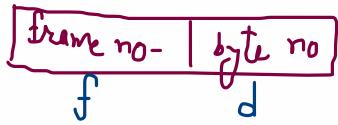
Physical add. space = collect'n of all physical addresses
(physical mem. size)

Logical add. Space (L.A.S.) :- collect'n of all logical addresses
(process size)

Data

Paging

physical add.



bits for frame no. = \log_2 (no. of frames in physical mem)

bits for byte no. = \log_2 (page size)

or

line no.

or

displacement

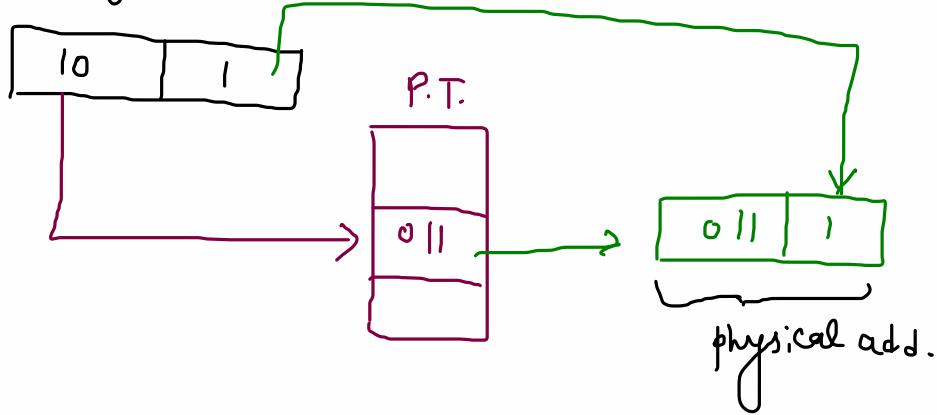
or

page offset

Paging

CPU generates logical address $\Rightarrow 101 \Rightarrow$ Page 10 & byte 1

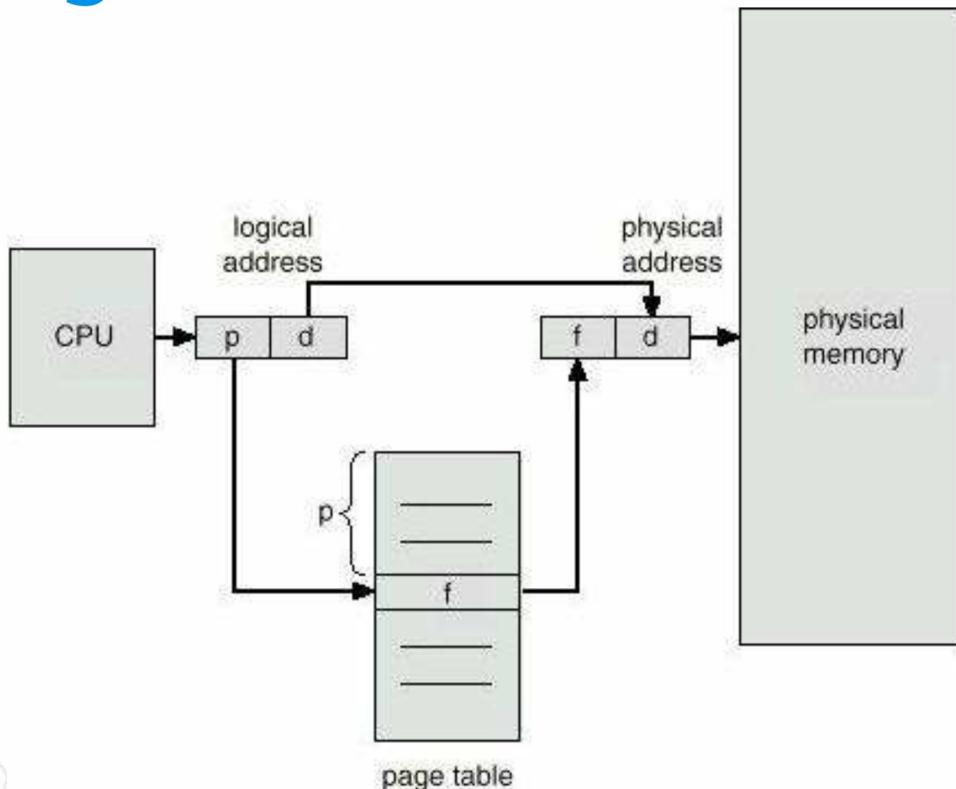
logical add.



Page table \Rightarrow frame $\Rightarrow 011$

byte 1

Paging



There is a Reg.
PTBR (Page Table Base Reg.)
↓
which holds starting physical add. of page table

Next Class

~~Performance Improvement~~



Questions ?

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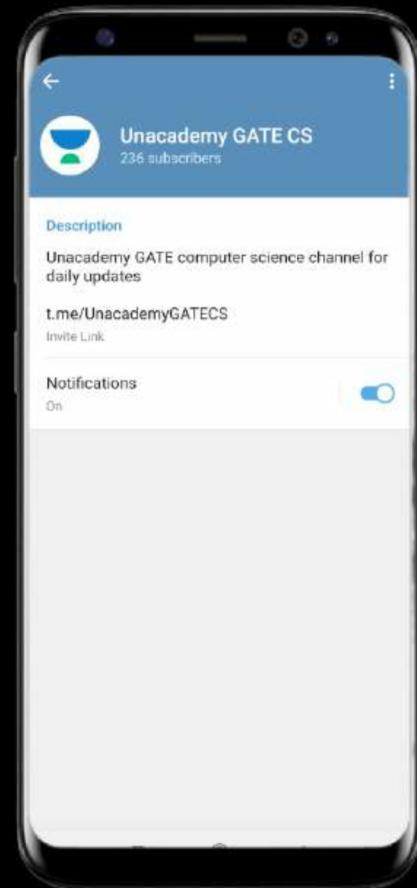
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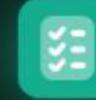


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