CS 3725 April. 5/12

- Static Partition
- Dynamic Partition
  - First Fit
  - Best Fit
- Relocatable Dynamic Arrays
- Paging

Relocatable Dynamic Arrays (continued...)

Adv
① Eliminates Fragmentation
② The content of the Job's address space do not have to be altered.
③ A job does not have to be brought back to the same space when it is swapped in/out.

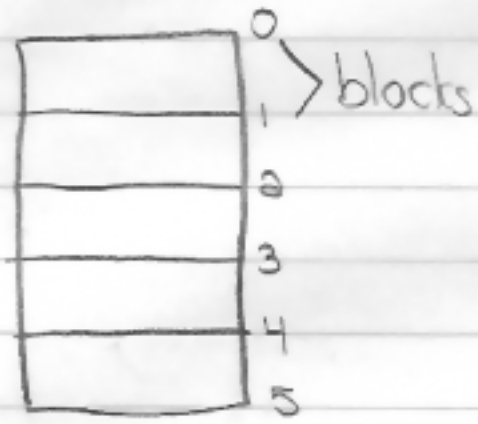
Disadv
① Moving a job requires read and write - consumes time.
② Job's logical address space must be less or equal to the physical address space
③ "Fossil" parts of a job remains in the memory - hence wasteful

→ Paging memory management schemes resolve the remaining disadvantages. (Virtual Memory)

Ideas
[I] The physical address space is (viewed as) a collection of EQUAL SIZE in continous BLOCKS

a) A physical address a_p is viewed as a pair (b, ℓ) where
$b \leftarrow$ block number
$\ell \leftarrow$ line number

ie.



b) If the block size $= 2^m$ then
(i) $a_p = b * 2^m + \ell$

(ii) $b = a_p$ DIV 2^m
$\ell = a_p$ MOD 2^m

eg. block size $= 2^5$
$a_p =$ 100100 | 01011
b ℓ

II The logical address space is also viewed as a collection of equal sized and continous regions called pages.

III Page size = Block size
a) A logical address a_ℓ is expressed as a pair (p, L) where
$P \propto$ page number
$L \propto$ Line number
b) (i) $a_\ell = p * 2^m + L$
(ii) $p = a_\ell$ DIV 2^m
$L = a_\ell$ MOD 2^m

IV ANY PAGE can be mapped on any block

V All the pages do not have to be in the physical memory at the same time. Only active pages can be in the memory at a time.

VI A job's logical address space is continous but its corresponding physical address may not be continous.

Page Map Table (PMT)

Page	block #	in memory flag
0	1	Y
1	3	Y
2	17	Y
...	...	N
n		

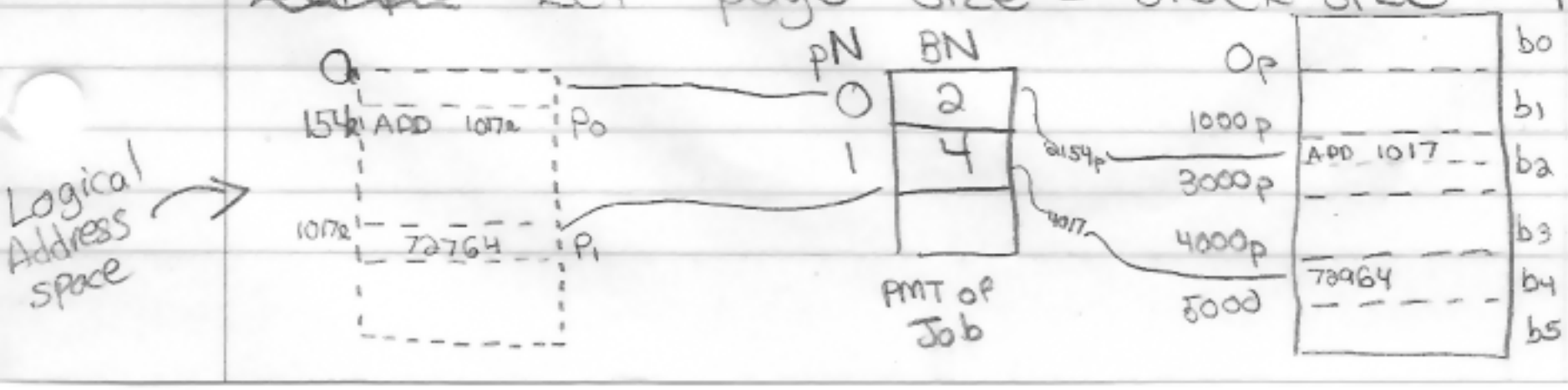
PMT of Job;

VII The mapping between the logical address (a_e) (binding) and its corresponding physical address (a_p) is as follows:

$a_e = (p, L)$ where $p = a_e \text{ DIV } 2^m$
$L = a_e \text{ MOD } 2^m$

$\therefore b = PMT(p)$
$\therefore a_p = b + 2^m + L$

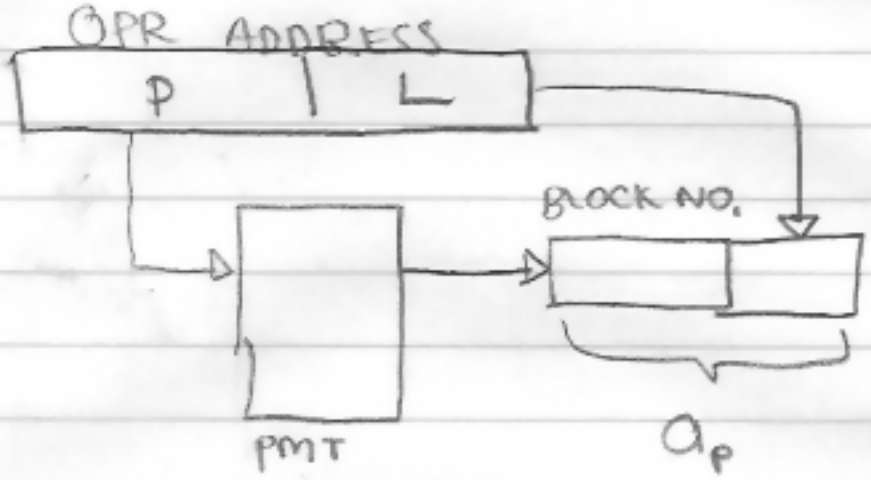
Example Let page size = block size = 1K



OPR = 1017

$p = 1 \Rightarrow PMT(1) = 4 = b \Rightarrow L = 17 \rangle a_p = 4017_p$

Hardware Support



Exam comprehensive
→ memory management question (1)