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FACULTY OF ENGINEERING & TECHNOLOGY

BCS-501 Operating System

Lecturer-37

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Allocation Methods

Contiguous Allocation

Allocation Methods – Linked

Linked Allocation

Allocation Methods

•An allocation method refers to how disk blocks are allocated for files:

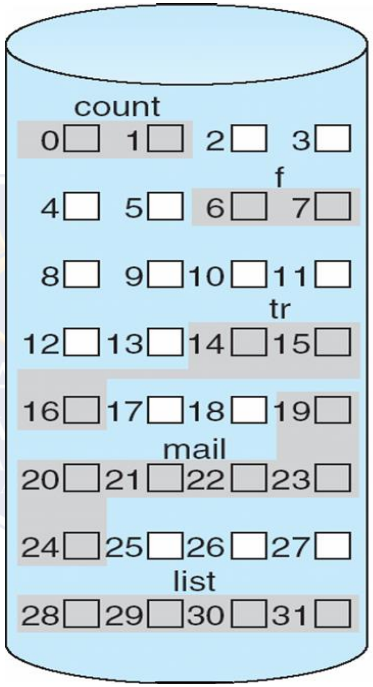
•Contiguous allocation – each file occupies set of contiguous blocks

- ➢Best performance in most cases
- ➢Simple – only starting location (block #) and length (number of blocks) are required
- ➢Problems include finding space for file, knowing file size, external fragmentation, need for compaction off-line (downtime) or on-line

Contiguous Allocation

•Mapping from logical to physical

•Block to be accessed = Q + starting address
•Displacement into block = R



directory

file	start	length
count	0	2
tr	14	3
mail	19	6
list	28	4
f	6	2

Allocation Methods - Linked

- Linked allocation – each file a linked list of blocks
- File ends at nil pointer
- No external fragmentation
- Each block contains pointer to next block
- No compaction, external fragmentation
- Free space management system called when new block needed
- Improve efficiency by clustering blocks into groups but increases internal fragmentation
- Reliability can be a problem
- Locating a block can take many I/Os and disk seeks
- FAT (File Allocation Table) variation
- Beginning of volume has table, indexed by block number
- Much like a linked list, but faster on disk and cacheable
- New block allocation simple

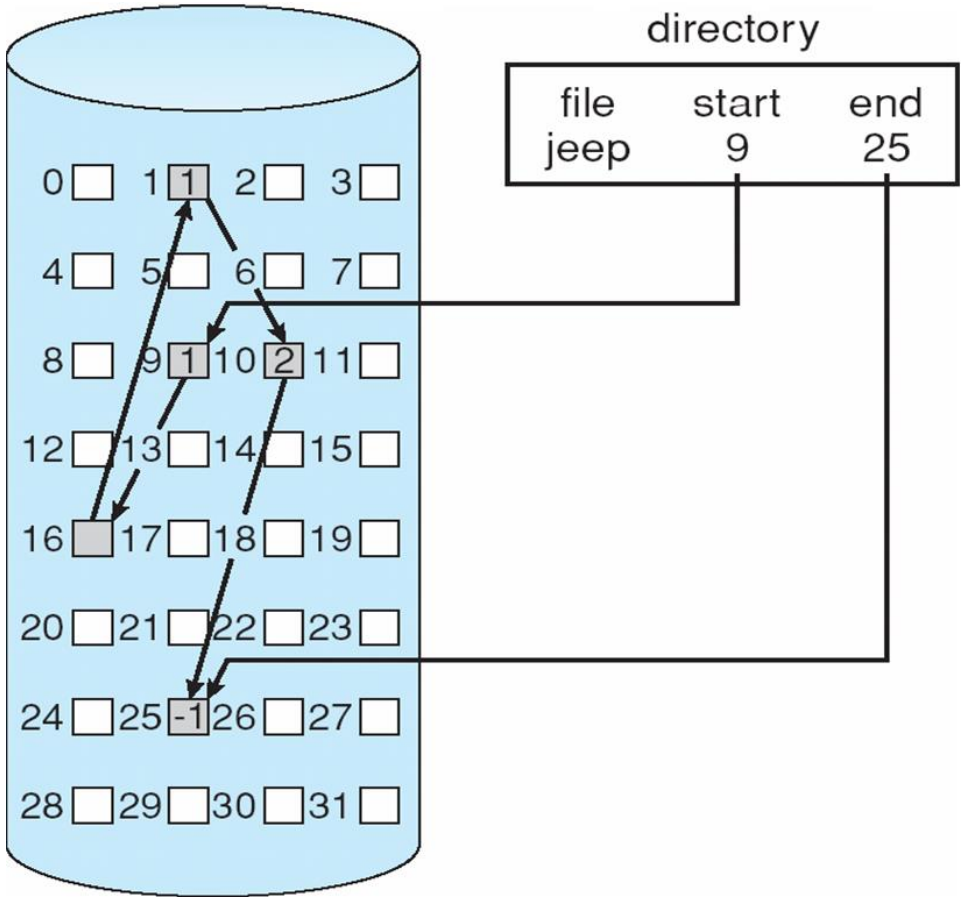
Linked Allocation

Each file is a linked list of disk blocks: blocks may be scattered anywhere on the disk.

Mapping:-Block to be accessed is the Qth block in the linked chain of blocks representing the file.

Displacement into block = R + 1

Linked Allocation



MCQ

Contiguous allocation has two problems ..... and ..... that linked allocation solves.

A. External -fragmentation
B. Internal -fragmentation
C. Memory
D. Storage

Linked allocation is a collection of……

A. Blocks
B. Brackets
C. Sets
D. None

Which method to allow each block contains pointer to next block

A. Static allocation
B. dynamic allocation
C. linked allocation
D. No allocation

Linked allocation doesn't have……

A. External -fragmentation
B. Internal –fragmentation
C. Synchronize
D. All of these

FAT stands for…….

A. File Allocation Table
B. File Allocated Table
C. Final Allocation Table
D. None of these