Secondary Storage Management

Disk drive

Block access devices

I/O is in units of block only

View of Hard disk:
array of blocks.

For a read on block # 1385,

OS initiates a DMA Transfer

Specify Source: block # 1385
--- destination: starting address in RAM

Specify nbytes = [block size]

/dev/
Free space Management

A. Bit Vector
B. Linked list
C. Grouping – Unix

Allocation Methods.
A. Contiguous Allocation
   Fast access;
   Fragmentation

B. Linked Allocation

C. Indexed Allocation
   – Unix

Unix V6 File System
   i-nodes
   super block
   i-size
   data blocks
nfree: 4

\[
\begin{array}{cccc}
0 & 1 & 2 & 3 \\
175 & 910 & 685 & 712 & 827 & \vdots & 78 & 99 \\
\end{array}
\]

free

= \# of elements of free array that contain free blocks.

Block # 827 is to be added to free list. [ A file containing block # 827 is being deleted ]

free[ nfree ] = 827
nfree ++

nfree: 3

\[
\begin{array}{cccc}
0 & 1 & 2 & 3 \\
210 & 315 & 450 & 900 & \vdots \\
\end{array}
\]

free[ ]

A file (being created) needs a free block.

nfree -- [ 2 ]
give free[ 2 ] [ 450 block ]

Another free block needed:

nfree -- [ 1 ]; give block 315

Another free block needed:

nfree -- [ 0 ];

nfree = 0; i read block free[ 0 ] = 210
Read in contents of фре210

1st 2 bytes of block #210 is new value of nfree
next 200 bytes of block #210 is the new free array
give block #210 to the file

10/17/13

superblock has Free Data block address
nfree: 0 1 2 3 4 5 6 7 8 9
free cmy [210]
100-element array

new value of nfree
new free array
Disk

Super block

i-nodes

data block

Size 1

Size 0, Size (3 Bytes)

File type

- 00 = plain file
- 10 = directory
- 11 = block special file
- 01 = char special file

A = set user on execution
   set gid ...

B = file access permission for
   user [owner]

C = ...

D = ...