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COP4600

HW4.2

25) Always searches for free blocks starting at the lowest-numbered block (FCFS).

Initial: 1000 0000 0000 0000 With file A: 1111 1110 0000 0000

a. 1111 1111 1111 0000

b. 1000 0001 1111 000

c. 1111 1111 1111 1100

d. 1111 1110 0000 1100

26) If the bitmap or free list containing the information about free disk blocks was completely lost due to a crash, it can be recovered by using a recovery algorithm to make a new free list with all the blocks in all the files. In a UNIX system, this recovery process involves scanning all the i-nodes in the file system and restoring the links with the files in them. While a FAT has no free list thus the issue cannot occur.

28) UNIX backup programs know which files to dump because it tracks the last dump where for every dump is recorded in this file. When dumping the file is read for the most recent dump, last entry and any file changed since that time is dumped.

29) The four bitmaps of Fig. 4-26 be different as:

a) value 21 would not be marked

b) value 21 would not be marked

c) no change

d) value 21 would not be marked

32) Cache Time: 1 msec Disk Time: 40 msec Hit Rate=h

EAT=(h)(CT)+(1-h)(DT) => h(1)+40×(1−h) msec -plot is just a straight line

33) For an external USB hard drive attached to a computer write-through cache is more suitable as it updates the cache while writing data to the hard drive. Meaning that if the USB was removed before the disk process is completed, the updated file will be on the USB.

35) 10 data blocks: 14-23 f1 starts at 22 and f2 starts at 16

FAT table entries: (14,18); (15,17); (16,23); (17,21); (18,20); (19,15); (20,−1); (21,−1); (22,19); (23,14).

f1: 22, 19, 15, 17, 21 f2: 16, 23, 14, 18, 20

36) Seek Time: 6msec Rotational Rate: 15,000 rpm => takes 4 msec to complete a disk cycle Size: 1,048,576 bytes per track

EAT= 6+2+(byte/1,048,576)×4

Time for 1 KB: 6+2+(1KB/1,048,576)×4 = about 6.0039 msec

Time for 2 KB: 6+2+(2KB/1,048,576)×4 = about 6.0078 msec

Time for 4 KB: 6+2+(4KB/1,048,576)×4 = about 6.0156 msec

Data rate for 1KB: (1KB/6.0039 msec)\*(1000ms/s) =170.556 KB/sec

Data rate for 2KB: (2KB/6.0078 msec)\*(1000ms/s) =340.890 KB/sec

Data rate for 2KB: (4KB/6.0156 msec)\*(1000ms/s) =680.896 KB/sec