1. This functionality requires addition of an address translation unity and the address translation could inconsistency between data structures maintained by CPU.

The advantage of this functionality is it allows a device to issue memory operation to mapped addresses of the target device.

1. 8KB =

80MB/sec =

So the transfer take

Thus, to read a file then write it back will take (5+0.977)\*2 m-sec which is 11.954 m-sec.

To compact half of a 16GB data, it will take 11.954 m-sec \* 12534.68 sec which is 3.48 hours.

Based on above answer, it doesn’t make sense to compacting the disk every time.

1. Because head alignment becomes difficult when track have become smaller.
2. For FCFS is 7081

For SSTF is 1745

For SCAN is 9769

For C-SCAN is 9769

1. 10 disk operations are needed.
2. (a) for the direct pointer: 4kb \* 10

For the indirect pointer: 4kb \* 1024

For the double-indirect pointer: 4kb \* 1024 \* 1024

For the triple-indirect pointer: 4kb \* 1024 \* 1024 \* 1024

Thus, the total space is 4KB \* 10 + 4KB \* 1024 + 4KB \* 1024^2 + 4KB \* 1024^3

(b) need two disk read, one disk read is for indirect block and one is for the actual data.

1. (a) in linux, we can add those 4990 users to a group and assign the file to that group to achieve that goal.

(b) for the 10 out of 4990, we can using access control list to do the specific requirement.

1. There are several differences between two operation.

First, the create – rename – delete will generate fragmentations and need operating system to manage the hardware storage.

Second, the create – rename – delete will change some of the metadata of the file such as creating date and modify date.

1. The file f1 uses 22, 19, 15, 17, and 21.

The file f2 uses 16, 23, 14, 18 and 20.

1. (a)file B is written, using five blocks:

1111 1111 1111 0000

(b)file A is deleted:

1000 0001 1111 0000

(c)file C is written, using eight blocks:

1111 1111 1111 1100

(d)file B is deleted:

1111 1110 0000 1100