Homework Wan Huzaifah bin Wan Azhar

Answer:



Seed 17:

1. mkdir(“/u”)
2. creat(“/a”)
3. unlink(“/a”)
4. mkdir(“/z”)
5. mkdir(“/s”)
6. creat(“/z/x”)
7. link(“/z/x”, “/u/b”)
8. unlink(“/u/b”)
9. fd=open(“/z/x” O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);
10. creat(“/u/b”)

Seed 18:

1. mkdir(“/f”)
2. creat(“/s”)
3. mkdir(“/h”)
4. fd=open(“/s” O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);
5. creat(“/f/o”)
6. creat(“/c”)
7. unlink(“/c”)
8. fd=open(“/f/o” O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);
9. unlink(“/s”)
10. unlink(“/f/o”)

Seed 19:

1. creat(“/k”)
2. creat(“/g”)
3. fd=open(“/k” O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);
4. link(“/k”, “/b”)
5. link(“/b”, “/t”)
6. unlink(“/k”)
7. mkdir(“/r”)
8. mkdir(“/p”)
9. mkdir(“/r/d”)
10. link(“/g”, “/s”)

Seed 20:

1. creat(“/x”)
2. fd=open(“/x” O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);
3. creat(“/k”)
4. creat(“/y”)
5. unlink(“/x”)
6. unlink(“/y”)
7. unlink(“/k”)
8. creat(“/p”)
9. fd=open(“/p” O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);
10. link(“/p”, “/s”)

A. Seed 21



inode bitmap 11000000

inodes [d a:0 r:3][d a:1 r:2][][][][][][]

data bitmap 11000000

data [(.,0) (..,0) (o, 1)][(.,1) (..,0)][][][][][][]



inode bitmap 11100000

inodes [d a:0 r:3][d a:1 r:2][f a:-1 r:1][][][][][]

data bitmap 11000000

data [(.,0) (..,0) (o, 1) (b, 2)][(.,1) (..,0)][][][][][][]



inode bitmap 11110000

inodes [d a:0 r:3][d a:1 r:2][f a:-1 r:1][f a=-1 r:1][][][][]

data bitmap 11000000

data [(.,0) (..,0) (o, 1) (b, 2)][(.,1) (..,0) (q, 3)][][][][][][]



inode bitmap 11110000

inodes [d a:0 r:3][d a:1 r:2][f a:2 r:1][f a=-1 r:1][][][][]

data bitmap 11100000

data [(.,0) (..,0) (o, 1) (b, 2)][(.,1) (..,0) (q, 3)][b][][][][][]



inode bitmap 11110000

inodes [d a:0 r:3][d a:1 r:2][f a:2 r:1][f a=3 r:1][][][][]

data bitmap 11110000

data [(.,0) (..,0) (o, 1) (b, 2)][(.,1) (..,0) (q, 3)][b][q][][][][]



inode bitmap 11111000

inodes [d a:0 r:3][d a:1 r:2][f a:2 r:1][f a:3 r:1][f a=-1 r:1][][][]

data bitmap 11110000

data [(.,0) (..,0) (o, 1) (b, 2)][(.,1) (..,0) (q, 3) (j, 4)][b][q][][][][]



inode bitmap 11011000

inodes [d a:0 r:3][d a:1 r:2][][f a:3 r:1][f a=-1 r:1][][][]

data bitmap 11010000

data [(.,0) (..,0) (o, 1)][(.,1) (..,0) (q, 3) (j, 4)][][q][][][][]



inode bitmap 11011000

inodes [d a:0 r:3][d a:1 r:2][][f a:3 r:1][f a=2 r:1][][][]

data bitmap 11110000

data [(.,0) (..,0) (o, 1)][(.,1) (..,0) (q, 3) (j, 4)][j][q][][][][]



inode bitmap 11111000

inodes [d a:0 r:3][d a:1 r:2][f a:-1 r:1][f a:3 r:1][f a=2 r:1][][][]

data bitmap 11110000

data [(.,0) (..,0) (o, 1)][(.,1) (..,0) (q, 3) (j, 4) (x, 2)][j][q][][][][]



inode bitmap 11111100

inodes [d a:0 r:3][d a:1 r:2][f a:-1 r:1][f a:3 r:1][f a=2 r:1][d a:4 r:2][][]

data bitmap 11111000

data [(.,0) (..,0) (o, 1)][(.,1) (..,0) (q, 3) (j, 4) (x, 2) (t, 5)][j][q][(., 5) (.., 1)][][][]

B. Seed 24

1. mkdir("/z");

inode bitmap 11000000

inodes [d a:0 r:2][d a:1 r:2][][][][][][]

data bitmap 11000000

data [(.,0) (..,0) (z, 1)][(., 1) (.., 0)][][][][][][]

1. creat(“/z/t”)

inode bitmap 11100000

inodes [d a:0 r:2][d a:1 r:2][f a:-1 r:1][][][][][]

data bitmap 11000000

data [(.,0) (..,0) (z, 1)][(., 1) (.., 0) (t, 2)][][][][][][]

1. creat("/z/z");

inode bitmap 11110000

inodes [d a:0 r:2][d a:1 r:2][f a:-1 r:1][f a:-1 r:1][][][][]

data bitmap 11000000

data [(.,0) (..,0) (z, 1)][(., 1) (.., 0) (t, 2) (z, 3)][][][][][][]

1. fd=open("/z/z", O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);

inode bitmap 11110000

inodes [d a:0 r:2][d a:1 r:2][f a:-1 r:1][f a:2 r:1][][][][]

data bitmap 11100000

data [(.,0) (..,0) (z, 1)][(., 1) (.., 0) (t, 2) (z, 3)][z][][][][][]

1. creat("/y");

inode bitmap 11111000

inodes [d a:0 r:2][d a:1 r:2][f a:-1 r:1][f a:2 r:1][f a:-1 r:1][][][]

data bitmap 11100000

data [(.,0) (..,0) (z, 1) (y, 4)][(., 1) (.., 0) (t, 2) (z, 3)][z][][][][][]

1. fd=open("/y", O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);

inode bitmap 11111000

inodes [d a:0 r:2][d a:1 r:2][f a:-1 r:1][f a:2 r:1][f a:3 r:1][][][]

data bitmap 11110000

data [(.,0) (..,0) (z, 1) (y, 4)][(., 1) (.., 0) (t, 2) (z, 3) (y, 4)][z][y][][][][]

1. fd=open("/z/t", O\_WRONLY|O\_APPEND); write(fd, buf, BLOCKSIZE); close(fd);

inode bitmap 11111000

inodes [d a:0 r:2][d a:1 r:2][f a:4 r:1][f a:2 r:1][f a:3 r:1][][][]

data bitmap 11111000

data [(.,0) (..,0) (z, 1) (y, 4)][(., 1) (.., 0) (t, 2) (z, 3)][z][y][t][][][]

1. link("/y", "/x");

inode bitmap 11111000

inodes [d a:0 r:2][d a:1 r:2][f a:4 r:1][f a:2 r:1][f a:3 r:2][][][]

data bitmap 11111000

data [(.,0) (..,0) (z, 1) (y, 4) (x, 4)][(., 1) (.., 0) (t, 2) (z, 3)][z][y][t][][][]

1. unlink("/x");

inode bitmap 11111000

inodes [d a:0 r:2][d a:1 r:2][f a:4 r:1][f a:2 r:1][f a:3 r:1][][][]

data bitmap 11111000

data [(.,0) (..,0) (z, 1) (y, 4)][(., 1) (.., 0) (t, 2) (z, 3) ][z][y][t][][][]

1. mkdir("/z/w");

inode bitmap 11111100

inodes [d a:0 r:2][d a:1 r:3][f a:4 r:1][f a:2 r:1][f a:3 r:1][d a:5 r:2][][]

data bitmap 11111100

data [(.,0) (..,0) (z, 1) (y, 4)][(., 1) (.., 0) (t, 2) (z, 3) (y, 4) (w, 5)][z][y][t][(., 5) (.., 1)][][]

* Both the inode and data block allocates based on next available space in their data structure.



* Mkdir() and Open() operation always fail.
* This is because when creating a new directory in maximum two block of data, the first block is the root directory, which makes the last block the last directory mkdir can allocate into.
* Mkdir will works but the system will run out of data blocks and thus exits.
* Open() is the same.
* Other operation, such as creat(), link(), unlink() can be successful because these operation will not use data blocks.
* The type of file the systems ends up with is empty file and links.



* No operation can be done as file cannot be created from creat() with not enough enode, and mkdir also cannot be created. In effect, open(), link() and unlink() cannot be performed.
* If we expand inode number to three, as long as there is one file or one directory, link, unlink, and open (for file) is possible.
* In essence, low number of data blocks can cause the system to cannot create new file or directory, however, low number of inode can cause whole system to fail or constrained to limited amount of file/directory.