File Systems II

CS 241

Dec. 2, 2013

#1(e)

- **Example file system:**
  - Each i-node contains 10 direct, 1 SI, 1 DI, 1 TI
  - Each disk block is 4 KB is size
  - Each disk pointer is 8 B long

- Detail how a 10 MB file would be stored?

#1(f)

- What is the maximum addressable size of the file system?

#1(g)

- How much space does a 1 byte file take up?

File System

Directory: /home/

File System

File: `/home/waf/hello.txt`

File System

System call: `stat()` : get file status

```
    int stat(const char *path, struct stat *buf);

struct stat {
    dev_t       st_dev;      /* ID of device containing file */
    ino_t       st_ino;      /* inode number */
    mode_t      st_mode;     /* protection */
    nlink_t     st_nlink;    /* number of hard links */
    uid_t       st_uid;      /* user ID of owner */
    gid_t       st_gid;      /* group ID of owner */
    dev_t       st_rdev;     /* device ID (if special file) */
    off_t       st_size;     /* total size, in bytes */
    blksize_t st_blksize;    /* blocksize for file system I/O */
    blkcnt_t  st_blocks;     /* number of 512B blocks alloc'd */
    time_t      st_atime;    /* time of last access */
    time_t      st_mtime;    /* time of last modification */
    time_t      st_ctime;    /* time of last status change */
};
```

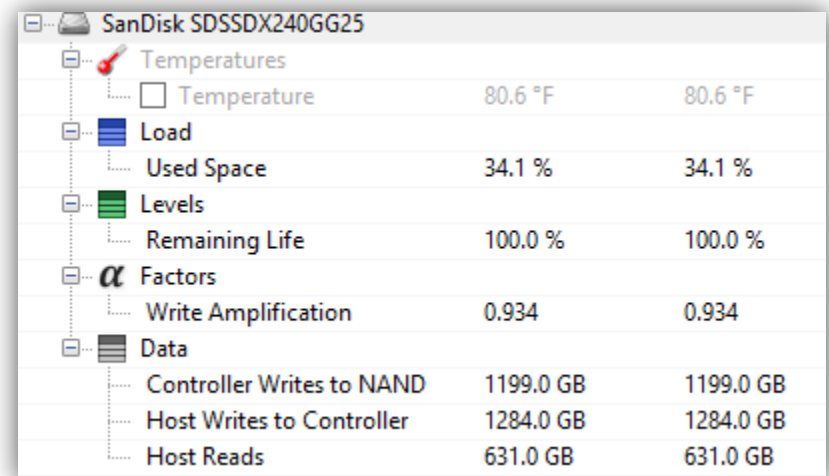# stat() vs. open()

File Permissions

File Permission:

Disks

Types of Disks:

Hard Disk Drive Considerations

Solid State Drive Considerations

SanDisk SDSSDX240GG25		
Temperatures		
Temperature	80.6 °F	80.6 °F
Load		
Used Space	34.1 %	34.1 %
Levels		
Remaining Life	100.0 %	100.0 %
Factors		
Write Amplification	0.934	0.934
Data		
Controller Writes to NAND	1199.0 GB	1199.0 GB
Host Writes to Controller	1284.0 GB	1284.0 GB
Host Reads	631.0 GB	631.0 GB

Other File Systems