East West University Bangladesh
Computing Science and Engineering Department

CSE-325: Operating System

Disk and File System Basics

Objectives:

The goal of this lab is to know the windows File Allocation Table (FAT). In this lab, you will learn:

- Hexadecimal Number System.
- FAT file system and boot sector details.
    - (Part a) tracing information from the given boot sector data (512 bytes)
        - **covered previous assignment**
    - (Part b) FAT, root directory and data area

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Data Blocks for a file:

Now we have known the root directory entries for NETWORK.VRS file. However we would also like to see the contents of the particular file.

Lets review what we know so far ..

- **The root directory starts at block 0x15 (block 21)**
- **The starting cluster of the file is 0x0f4e**
- **The first allocation unit starts at the first block after the root directory.**

But we don't know:

- **Where the root directory ends.**

Thus, we need to know the **total size of root directory** and to trace that we need to find **the total number of root directories**.
The number of total root directories is in boot sector, lets that is 0x0040 (64 in decimal); we have known that each root entry consists 32 bytes. Thus total bytes hold by root directory is 64x32=2048 bytes =2048/512 blocks =4 blocks**.**

Root directory starts at block 0x15. Thus the first allocation unit starts at ox15 +4 or 0x19.
And to convert a cluster number (which is what appears in the root directory) to a block number, we need to add 0x17, to allow for that strange offset of 2.
We now know that the first data block of the file is at cluster number 0xf4e (see above). Adding the constant we have discovered, we find that this is block number 0xf4e+0x17, or 0xf65. Let's look at block 0xf65:

```
Block 3941 (0x0f65)
      0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
000  20 20 20 54 77 61 73 20 74 68 65 20 6e 69 67 68    Twas the nigh
010  74 20 62 65 66 6f 72 65 20 73 74 61 72 74 2d 75 t before start-u
020  70 20 61 6e 64 20 61 6c 6c 20 74 68 72 6f 75 67 p and all throug
030  68 20 74 68 65 20 6e 65 74 2c 0a 20 20 20 20 20 h the net,.
040  6e 6f 74 20 61 20 70 61 63 6b 65 74 20 77 61 73 not a packet was
050  20 6d 6f 76 69 6e 67 3b 20 6e 6f 20 62 69 74 20  moving; no bit
060  6e 6f 72 20 6f 63 74 65 74 2e 0a 20 20 20 54 68 nor octet..   Th
070  65 20 65 6e 67 69 6e 65 65 72 73 20 72 61 74 74 e engineers ratt
080  6c 65 64 20 74 68 65 69 72 20 63 61 72 64 73 20 led their cards
090  69 6e 20 64 65 73 70 61 69 72 2c 0a 20 20 20 20 in despair,.
0a0  20 68 6f 70 69 6e 67 20 61 20 62 61 64 20 63 68  hoping a bad ch
0b0  69 70 20 77 6f 75 6c 64 20 62 6c 6f 77 20 77 69 ip would blow wi
0c0  74 68 20 61 20 66 6c 61 72 65 2e 0a 20 20 20 54 th a flare..   T
0d0  68 65 20 73 61 6c 65 73 6d 65 6e 20 77 65 72 65 he salesmen were
0e0  20 6e 65 73 74 6c 65 64 20 61 6c 6c 20 73 6e 75  nestled all snu
0f0  67 20 69 6e 20 74 68 65 69 72 20 62 65 64 73 2c g in their beds,
100  0a 20 20 20 20 20 77 68 69 6c 65 20 76 69 73 69 .     while visi
110  6f 6e 73 20 6f 66 20 64 61 74 61 20 6e 65 74 73 ons of data nets
120  20 64 61 6e 63 65 64 20 69 6e 20 74 68 65 69 72  danced in their
130  20 68 65 61 64 73 2e 0a 20 20 20 41 6e 64 20 49  heads..   And I
140  20 77 69 74 68 20 6d 79 20 64 61 74 61 73 63 6f  with my datasco
150  70 65 20 74 72 61 63 69 6e 67 73 20 61 6e 64 20 pe tracings and
160  64 75 6d 70 73 0a 20 20 20 20 20 70 72 65 70 61 dumps.     prepa
170  72 65 64 20 66 6f 72 20 73 6f 6d 65 20 70 72 65 red for some pre
180  74 74 79 20 62 61 64 20 62 72 75 69 73 65 73 20 tty bad bruises
190  61 6e 64 20 6c 75 6d 70 73 2e 0a 20 20 20 57 68 and lumps..   Wh
1a0  65 6e 20 6f 75 74 20 69 6e 20 74 68 65 20 68 61 en out in the ha
1b0  6c 6c 20 74 68 65 72 65 20 61 72 6f 73 65 20 73 ll there arose s
1c0  75 63 68 20 61 20 63 6c 61 74 74 65 72 2c 0a 20 uch a clatter,.
1d0  20 20 20 20 49 20 73 70 72 61 6e 67 20 66 72 6f     I sprang fro
1e0  6d 20 6d 79 20 64 65 73 6b 20 74 6f 20 73 65 65 m my desk to see
1f0  20 77 68 61 74 20 77 61 73 20 74 68 65 20 6d 61  what was the ma
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