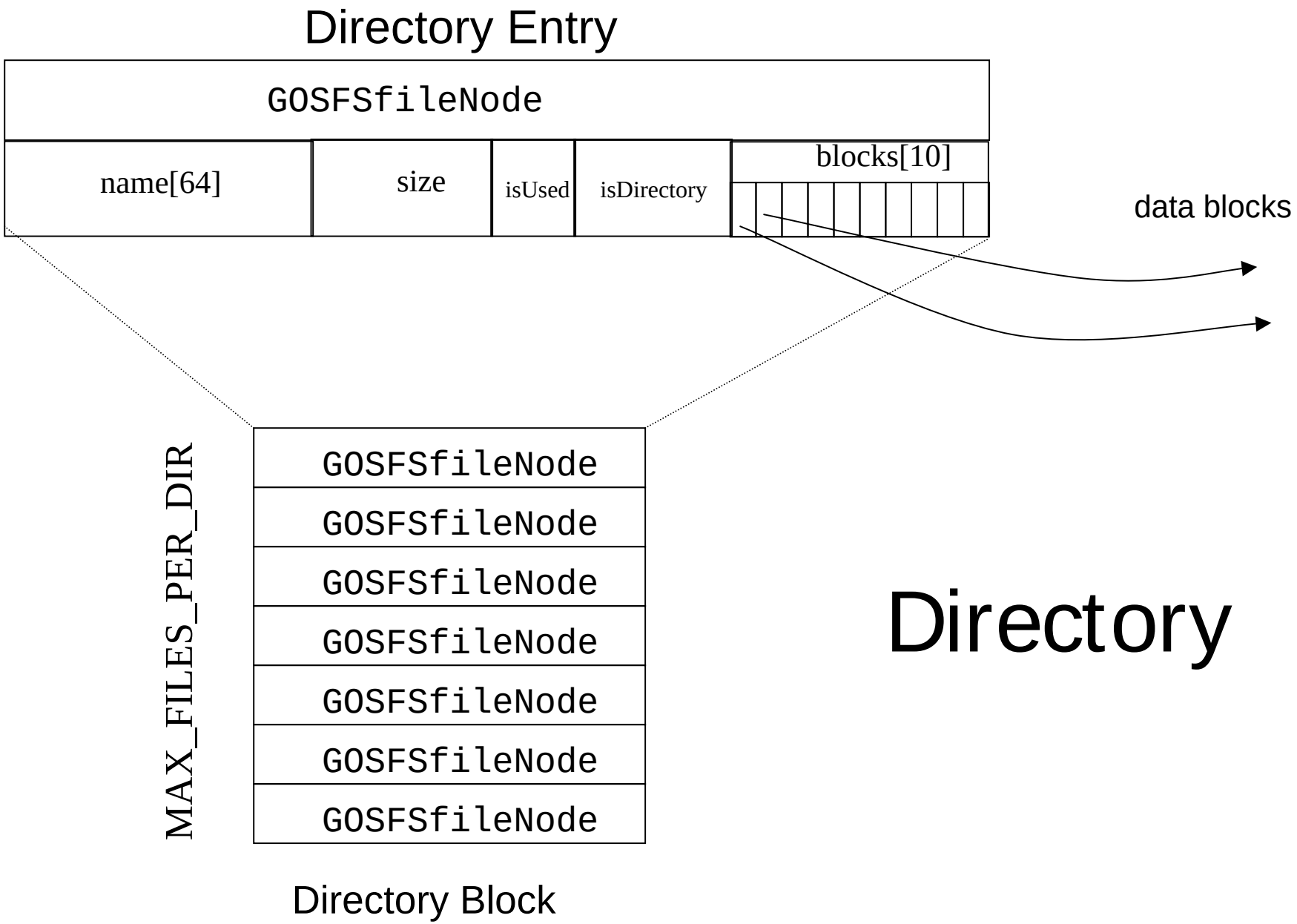
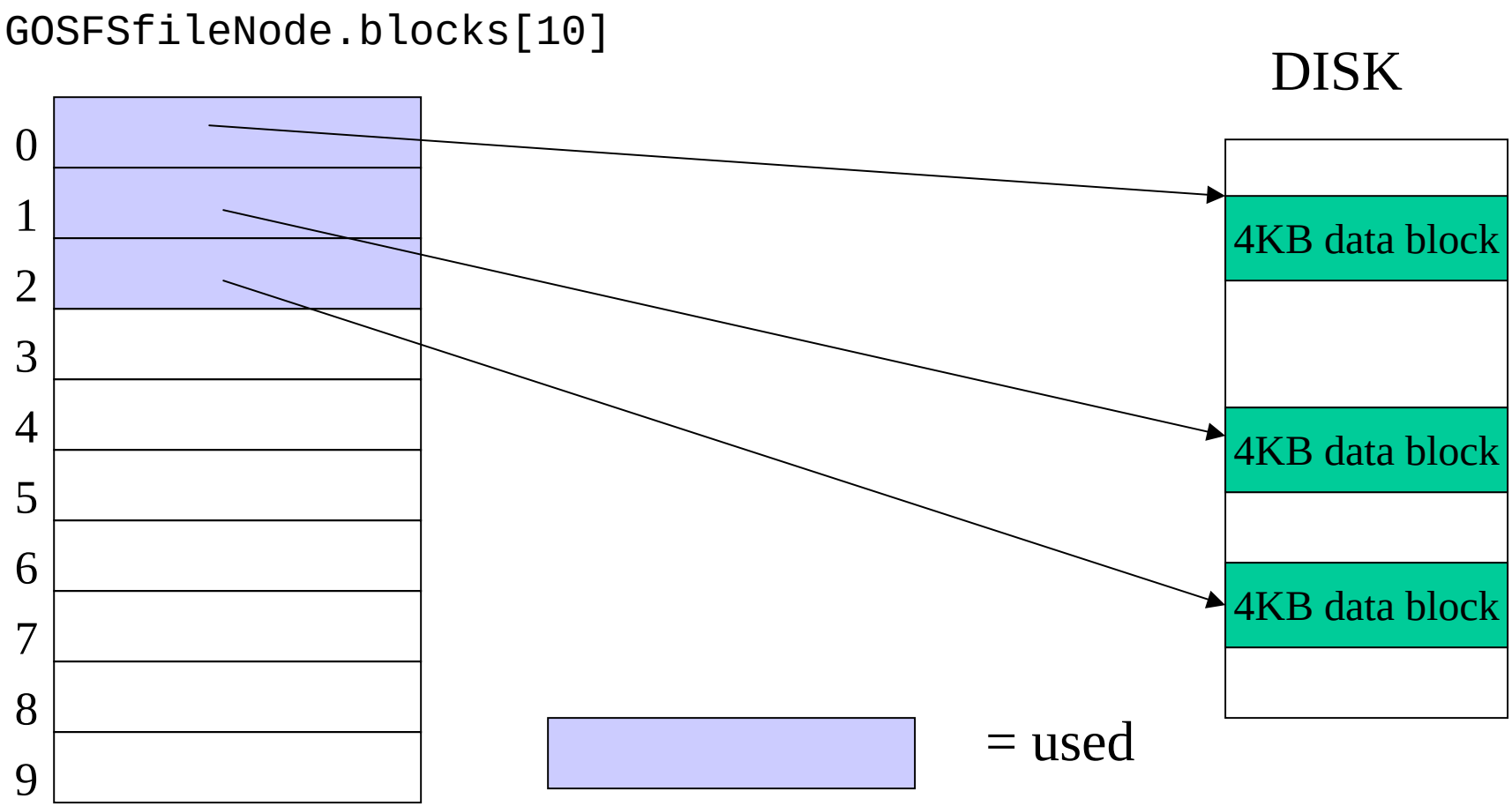
Project 5

Logical layout of the disk

<table>
<tr><td colspan="5">SUPERBLOCK</td><td>REST OF THE DISK</td></tr>
<tr><td colspan="5">4KB</td><td>32 MB-4KB</td></tr>
<tr><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>1024 bytes</td><td>4KB-1036 bytes= 3060 bytes</td><td>32 MB-4KB</td></tr>
<tr><td>Magic</td><td>Root Dir Pointer</td><td>Size</td><td>Free Blocks Bitmap</td><td>Free</td><td>Data
(Not allocated blocks or blocks allocated to directories/files)</td></tr>
</table>

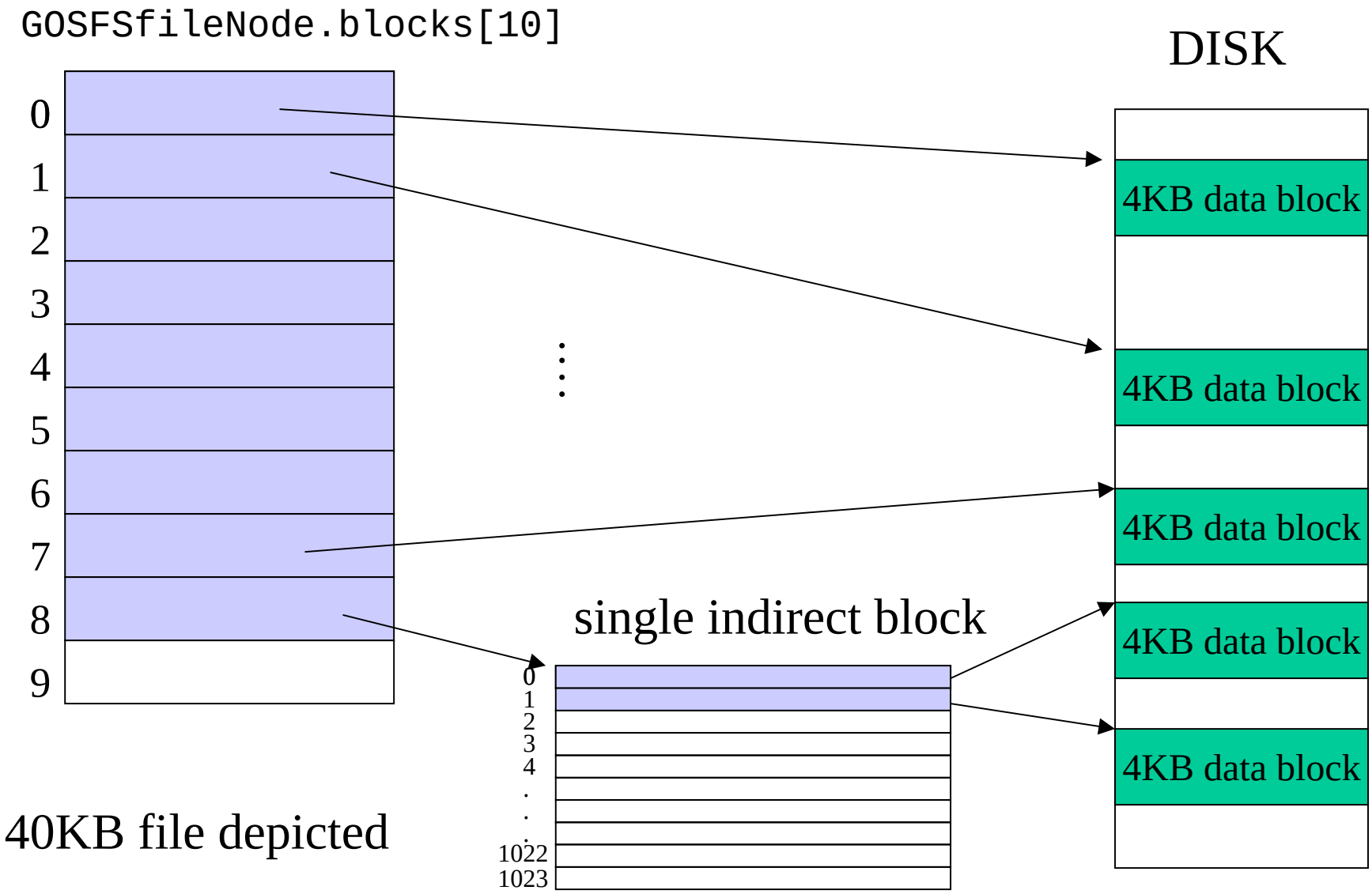

Directory Entry
GOSFSfileNode
name[64]
size
isUsed
isDirectory
blocks[10]
data blocks
MAX_FILES_PER_DIR
GOSFSfileNode
GOSFSfileNode
GOSFSfileNode
GOSFSfileNode
GOSFSfileNode
GOSFSfileNode
GOSFSfileNode
Directory Block
Directory

Data storage –Direct Mapping

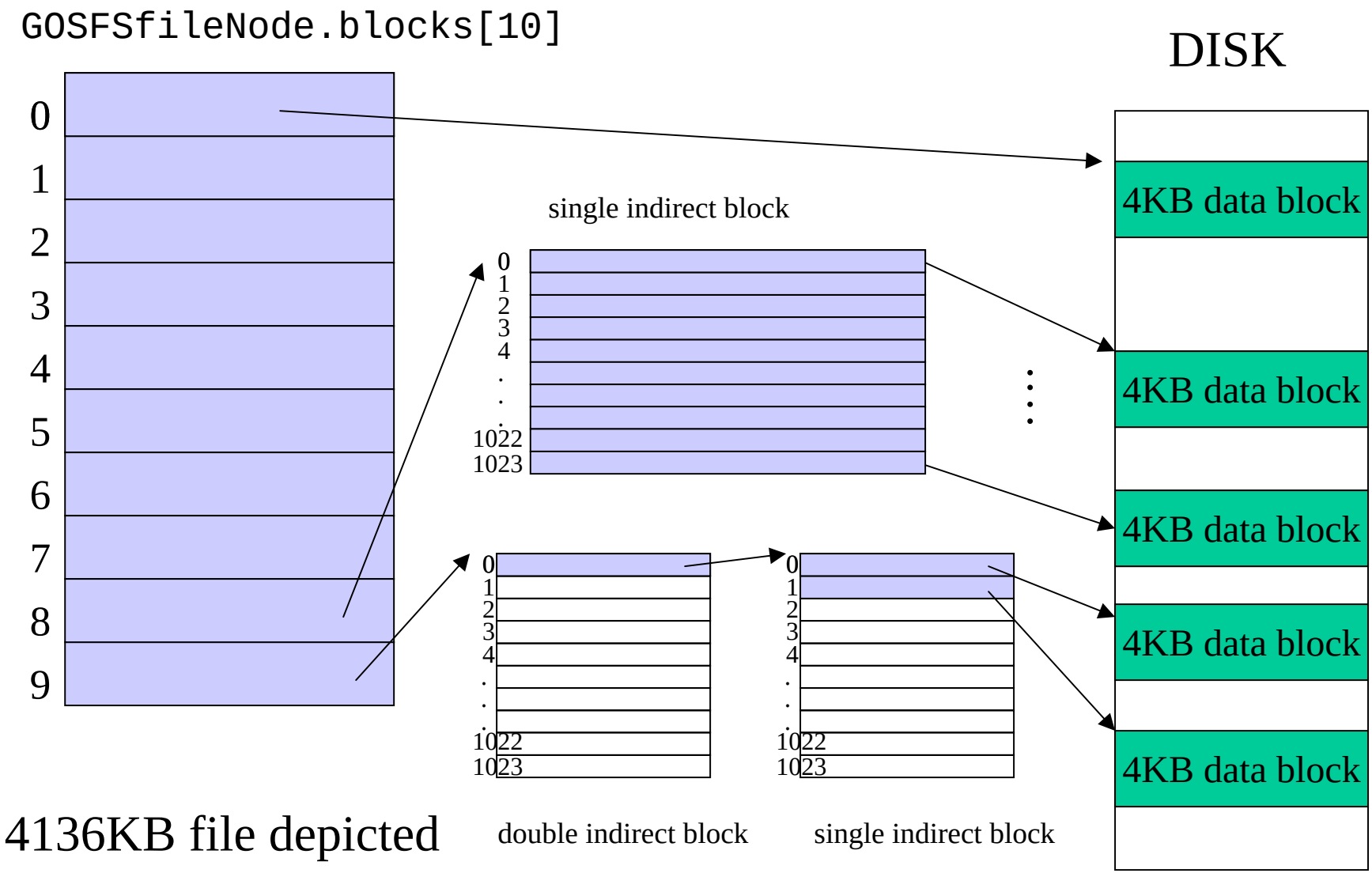


12KB file depicted

Data storage –Single Indirect



Data storage –Double Indirect



Data storage - overview

- [0,32KB] – use direct mapped blocks only
- (32KB,4128KB] – use direct mapped blocks + single indirect blocks
- (4128KB,32MB] – use direct mapped blocks + single indirect blocks + double indirect blocks

Mount

- SYS_MOUNT
  - `Mount(char *name, int drive, char *fstype)`
- Make sure it works, so that we can test the rest of your project

- SYS_OPEN
  - `Open(char *name, int permissions)`
  - openFile.mode :
    - O_CREATE|O_READ|O_WRITE
  - openFile.fsType :
    - FS_TYPE_NONE free slot

- SYS_CLOSE
  - `Close(int fd)`

- SYS_DELETE
  - `Delete(char *name)`
  - If directory and not empty, forbid !

- SYS_READ
  - `Read(int fd, char *buffer, int length)`
  - Watch out return value !
- SYS_WRITE
  - `Write(int fd, char *buffer, int length)`
  - Not allowed for directories; use Open(,O_CREATE) or CreateDirectory instead
  - “Grow on write” - allocate blocks “on the fly” if past end of file
  - Synchronous
- SYS_READ/SYS_WRITE increase the offset with #bytes read/written

- SYS_STAT
  - `Stat(int fd, fileStat *stat)`
  - Simply copy verbatim from `GOSFSfileNode`
- SYS_SEEK
  - `Seek(int fd, int offset)`
  - Implement only absolute semantics for *offset*
  - Not allowed to past end of file

- SYS_CREATEDIR
  - `CreateDirectory(char *name)`
  - Should work recursively
    - `CreateDirectory("/d/d1/d2/d3/d4”);`

- SYS_FORMAT
  - `Format(int drive)`
  - `Disk Layout`
  - `Don’t have to do it in init`
  - `Only for GOSFS`

This document was created with Win2PDF available at http://www.daneprairie.com.
The unregistered version of Win2PDF is for evaluation or non-commercial use only.