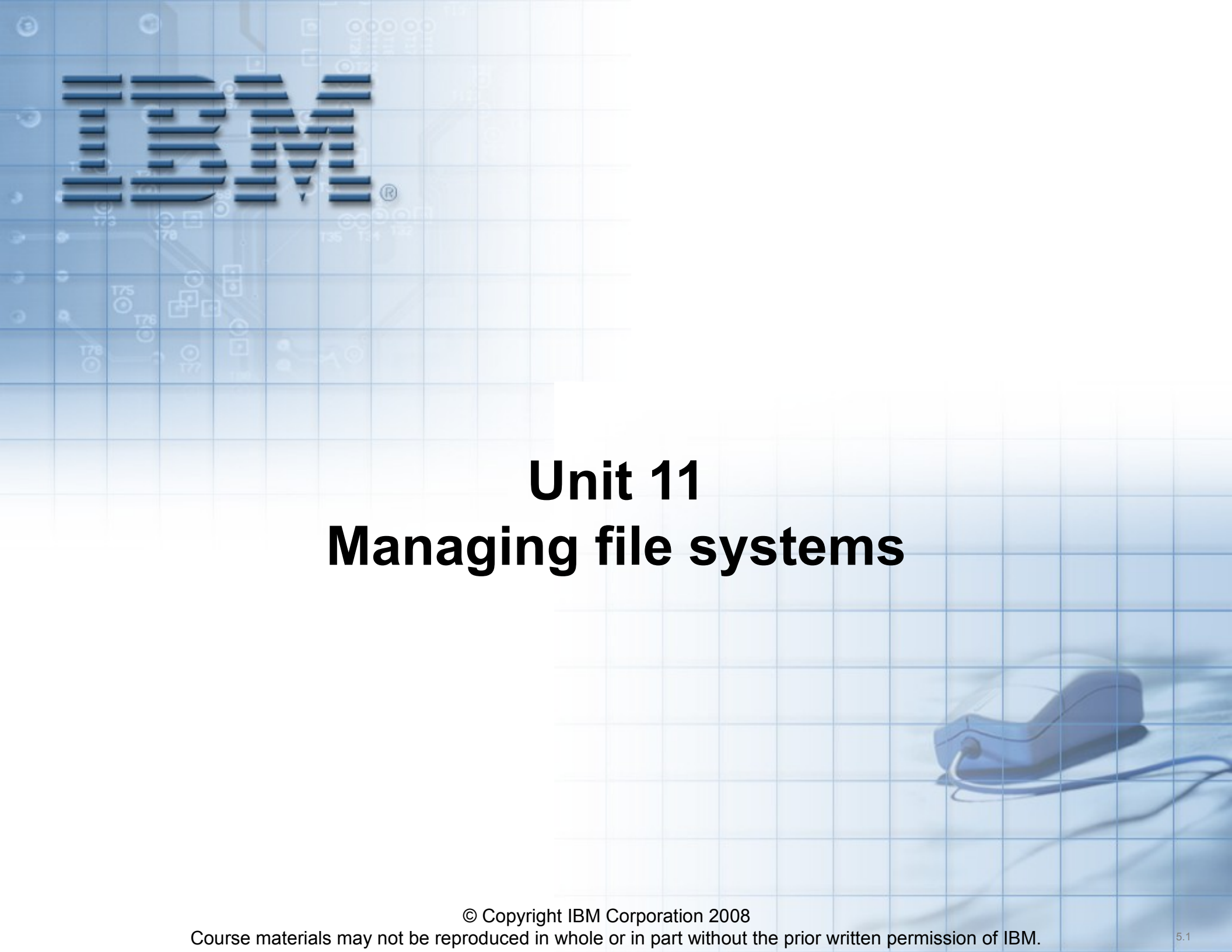


Unit 11
Managing file systems

Unit objectives

After completing this unit, you should be able to:

- Monitor file system growth and control growing files
- Manage file system disk space usage
- Implement basic file system integrity checks

Space management

- File systems expand upon notice, NOT automatically
- To keep from running into problems:
  - Monitor file system growth
  - Determine causes
  - Control growing files
  - Manage file system space usage
  - Control user disk usage
  - Defragment file system

Listing free disk space

- The **df** command displays information about total space and available space on a file system

```
# df
```

```
Filesystem    512-blocks      Free %Used    Iused %lused Mounted on
/dev/hd4          294912    228088   23%     1925     7% /
/dev/hd2         3309568    339408   90%    36788    47% /usr
/dev/hd9var        65536     37600   43%      479    11% /var
/dev/hd3          131072    129352    2%       54     1% /tmp
/dev/hd1           32768     32064    3%        5     1% /home
/proc                  -         -    -        -     -  /proc
/dev/hd10opt      163840     20760   88%     1617    36% /opt
/dev/hd11admin    262144    261416    1%        5     1% /admin
/dev/ramdisk0       8192      7848    5%       17     2% /ramdisk
```

Control growing files

- /var/adm/wtmp
- /etc/security/failedlogin
- /var/adm/sulog
- /var/spool/*/*
- $HOME/smit.log
- $HOME/smit.script
- $HOME/websm.log
- $HOME/websm.script

The **skulker** command

- The **skulker** command cleans up file systems by removing unwanted or obsolete files
- Candidate files include:
  - Files older than a selected age
  - Files in the **/tmp** directory
  - **a.out** files
  - **core** files
  - **ed.hup** files
- **skulker** is normally invoked daily by the **cron** command as part of the **crontab** file of the **root** user
- Modify the **skulker** shell script to suit local needs for the removal of files

Listing disk usage

- The **du** command can be used to list the number of blocks used by a file or a directory

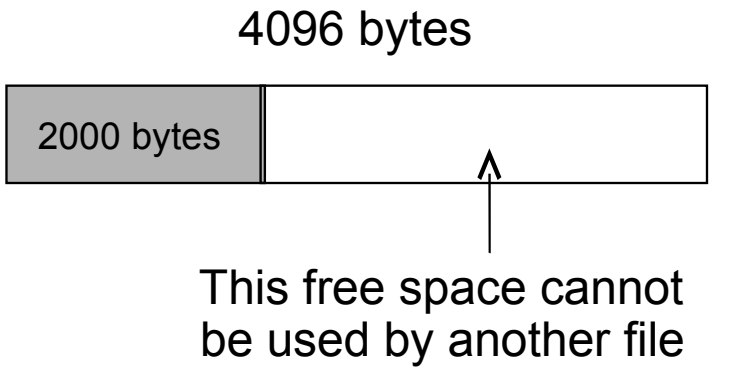
```
# du /home | sort -r -n

   624    /home
   392    /home/fred
   98     /home/tom
   54     /home/mary
   52     /home/liz
   23     /home/suzy
   2      /home/guest
   1      /home/steve
```

- To view individual file sizes, use the **ls -l** command

Fragmentation considerations

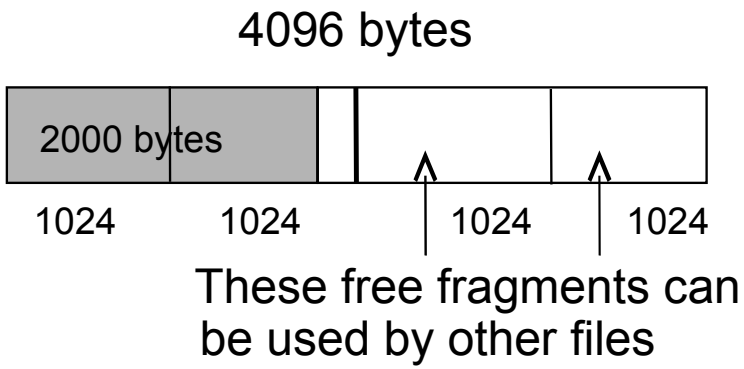
Without fragmentation

File size = 2000 bytes



With fragmentation

File size = 2000 bytes
Fragment size = 1024 bytes



Considerations to be made:

- Disk space allocation
- Disk space utilization
- I/O activity
- Free space fragmentation
- Fragment allocation map

Defragmenting a file system

- The **defragfs** command increases a file system's contiguous free space
- The file system must be mounted

```
defragfs [-q | -r | -s]  filesystem
```

Options:

-q Reports the current state of the file system

-r Reports the current state of the file system and the state that would result if the **defragfs** command is run without either **-q**, **-r** or **-s**

-s Gives short report regarding the current state of the file system

Verify a file system

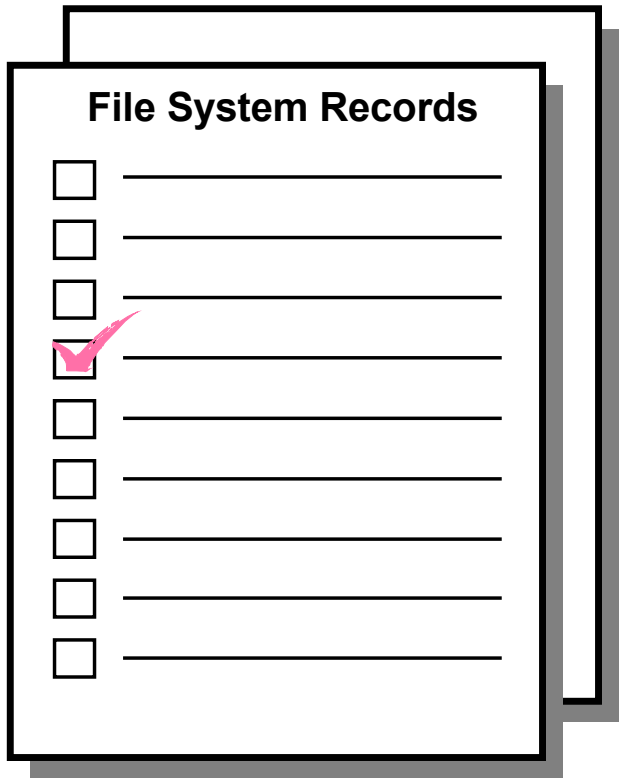
- Command syntax:

```
fsck [-p | -y | -n] [-f] [   file system ]
```

- Checks journal log
- Checks inodes, indirect blocks, data blocks, free lists
- If no file system name is specified, the **fsck** command checks all file systems which have the **check=true** attribute set in the **/etc/filesystems**
- Orphan files are placed in the **lost+found** directory
- Unmount the file system before running **fsck**

Documenting file system setup

- Run the **`lsfs`** command
- Get the contents of the **/etc/filesystems** file
- Run the **`df`** command to check free space
- Check all the mounted file systems by running the **`mount`** command



Checkpoint

1. What command can you use to determine if a file system is full? _____

4. What two commands can be used to find the files and users that are taking the most disk space?
   - _____
   - _____

7. True or False? It is good practice to run **`fsck -y`** on all file systems, even if they are mounted.

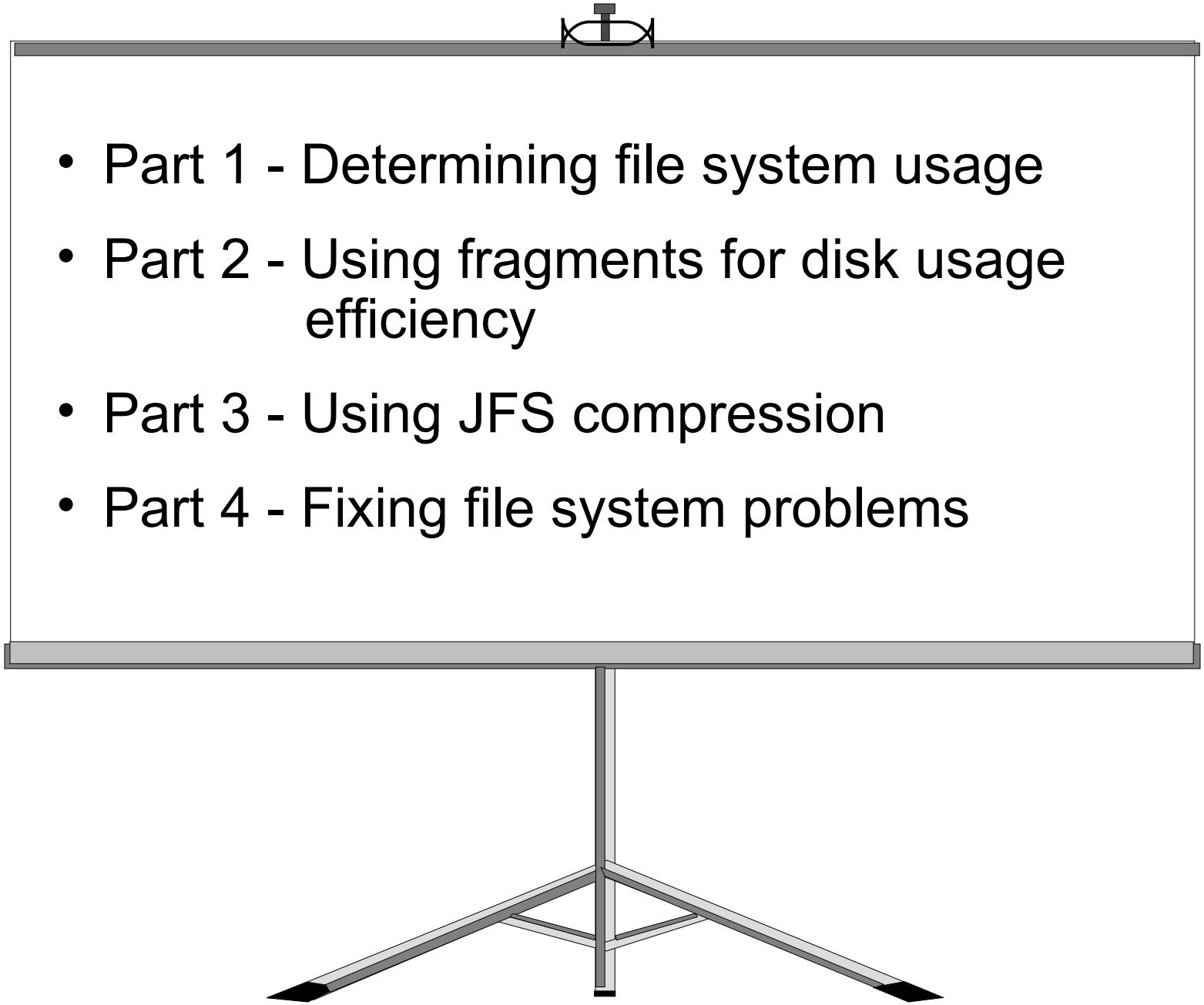
Checkpoint solutions

1. What command can you use to determine if a file system is full? **df**

4. What two commands can be used to find the files and users that are taking the most disk space?
   - **du**
   - **ls -l**

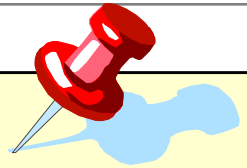
7. True or False? It is good practice to run **fsck -y** on all file systems, even if they are mounted.

Exercise 11: Managing file systems



- Part 1 - Determining file system usage
- Part 2 - Using fragments for disk usage efficiency
- Part 3 - Using JFS compression
- Part 4 - Fixing file system problems

Unit summary



- File system management does not just happen on the system. File systems need to be regularly monitored to ensure that they do not run out of space.
- To ensure the integrity of file systems, checks have to be carried out whenever file system corruption is suspected.