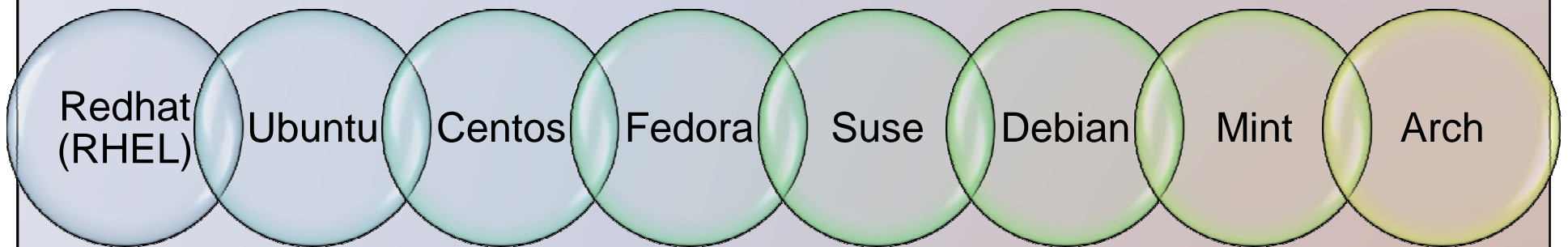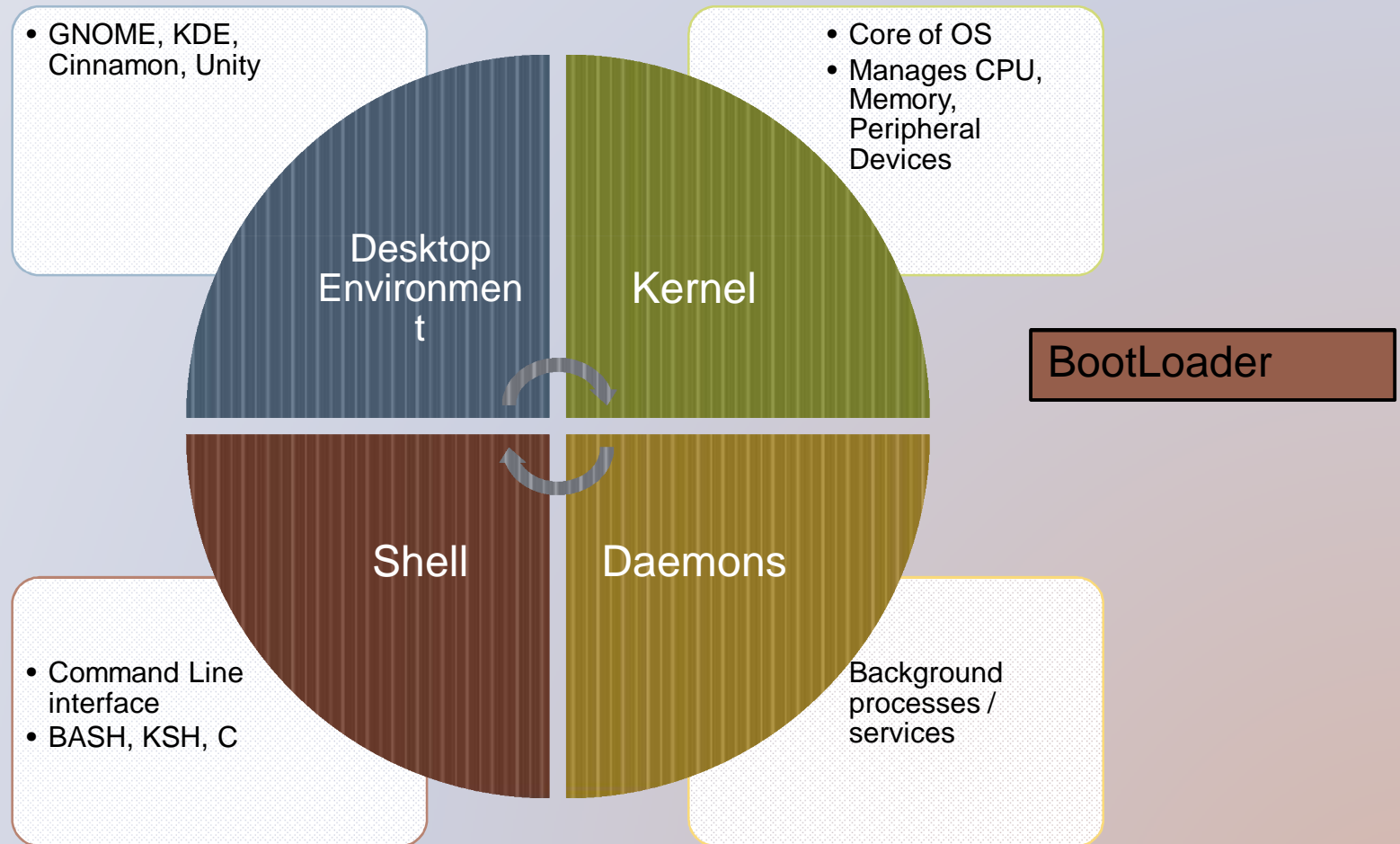# INTRODUCTION TO LINUX

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What is Linux

- Open Source Operating System
- Developed by Linus Torvalds,   in 1991
- Security Conscious
- More popular for Server OS
- Popular Customization - Android

Redhat
(RHEL)

Ubuntu

Centos

Fedora

Suse

Debian

Mint

Arch

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Components of Linux

- GNOME, KDE, Cinnamon, Unity

- Core of OS
- Manages CPU, Memory, Peripheral Devices

Desktop Environment

Kernel

BootLoader

Shell

Daemons

- Command Line interface
- BASH, KSH, C

Background processes / services

Installing Software on Linux

- App Store

- Debian based systems use

  sudo apt-get install wget

- Fedora based systems

  su

  yum install wget

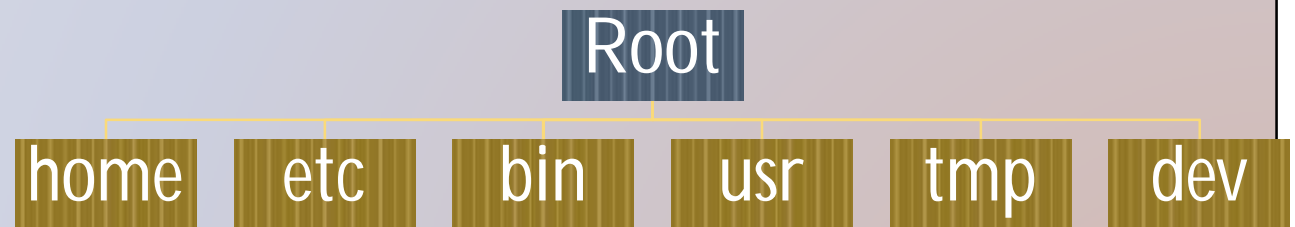Introduction to Linux   Dr. Padmaja Joshi
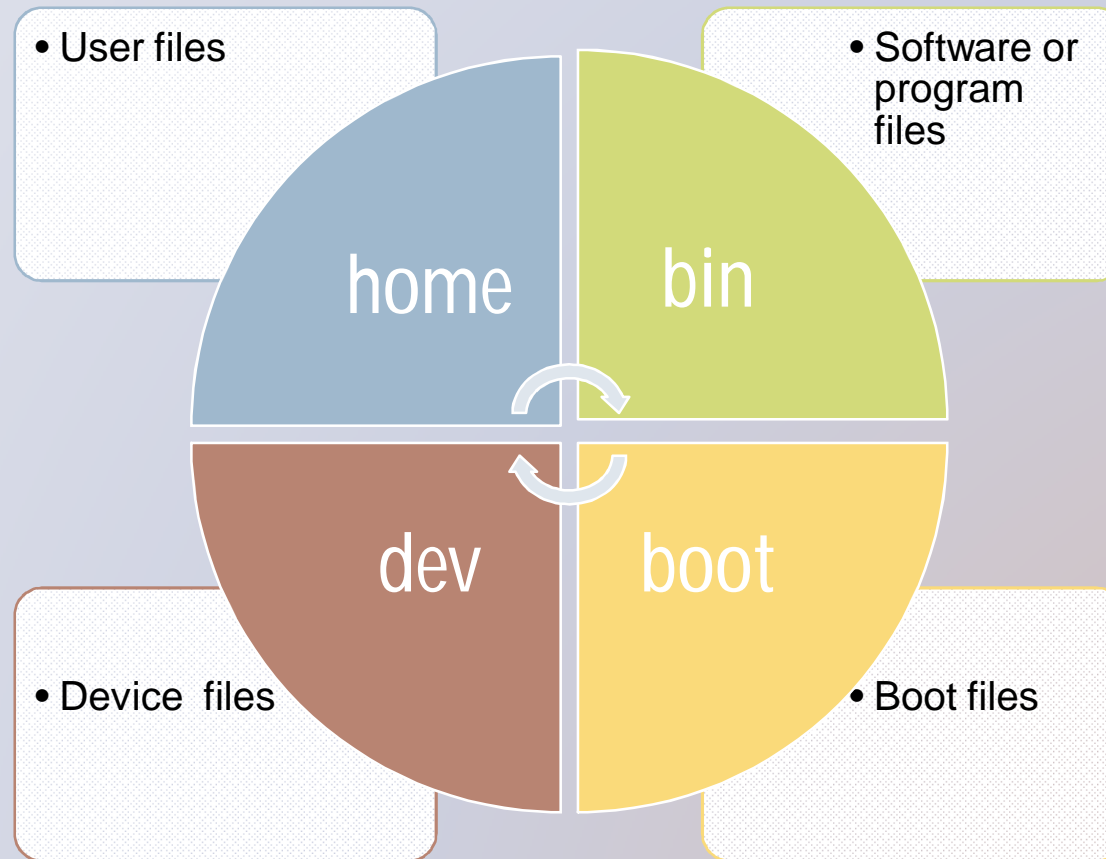
File Systems

Windows

- Files are stored in different drives – C:, D:, E: etc

Linux

- Everything is file in Linux e.g. directories, devices like printers, mouse, keyboard etc.

```
                    Root
   ┌──────┬──────┬──────┬──────┬──────┐
 home    etc    bin    usr    tmp    dev
```

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Linux File System

- User files

- Software or program files

home

bin

dev

boot

- Device files

- Boot files

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Common
Programs

bin

Boot Files

boot

Optical Drive Files

cdrom

Device Files

dev

Configuration Files

etc

User's Home Directory

home

Shared Libraries

lib

Damaged Files

lost+found

Removable
Media Files

media

Manually
Mounted file systems

mnt

Add-on
Software Packages

opt

System Status
Files

proc

Root User
Home Directory

root

Running
Applications Files

run

System Admin
Programs

sbin

Linux Security
Files

selinux

Data for Services by
the system

srv

System Files

sys

Temporary Files

tmp

User/s Utilities and
Applications

usr

Log files
and others

var

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File Management

➢Types of Files

Ordinary Files - normal files-image, video, programs, Text

Directories – Similar to that of folders in windows

Special Files – providing access to hardware such as drivers

All device files are stored under /dev

➢All files have permissions of read, write and execute

➢In windows we cannot have two files with the same names in the same directory, but in Linux two files in the same folder can have the same name provided there is some case difference in the names.

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Users

➢Linux has Three types of users

• Regular   - all files are stored under /home. Regular

users are not allowed to access files of other users.

• Administrative (root)- known as a **superuser.** Has all

administrative privileges such as installation of

software, making changes to the file system.

• Service User – Linux runs various services such as

apache, Squid, email etc and provides the access to

selective users. This account type is available only in

the server version.

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Windows Users

➢Windows has four types of users

　➢Administrator

　➢Standard

　➢Child

　➢Guest

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Metacharacters

- * - any number of characters from 0 onwords
- ? - One character
- . – Hidden files

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Directory Management

$ pwd - current working directory

- To go to home directory

$ cd ~

- To go to the home directory of a particular user

$ cd ~username

- To go to your last directory

$ cd -

Commands related to Directories

- Make or create directory - mkdir
- Delete directory   - rmdir
- Rename directory - mvdir

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Commands on files

- Creating new file

  cat > <filename>

    …

      …

cntrl + d

- View file - cat <filename>
- Combining or merging two files

  cat <file1> <file2>   >   <merged file>

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Commands related to Files

- Copy a file – cp <file1> <file2>
- Del a file - rm <file1>
- Rename a file – mv <file1> <file2>
- Create an alias of a file   - ln <source> <target>
- View the contents of the file – cat <filename>
- Print file – pr <filename>
- Merge files – cat file1 file2 > file3
- Sort a file - sort <filename>

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Commands related to Files

- Compare files – cmp <file1> <file2>
- Search file for a keyword – grep regular_expr filename
- Count lines/words/characters in a file – wc [option] filename

    -l : lines ; -w : words; -c: characters

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Some more commands

- tail [option] <filename>- display last few lines of the file

- head [option] <filename> - Display top few lines of the file

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Redirection

- >

- >>   - append

- <   input

File Permissions

- Owner permissions
- Group Permissions
- Other Permissions

- Permission Indicators

  read (r), write (w), execute (x)

Changing Permissions

chmod

  + add permission

   - Remove permiss

   = set permission

 u – owner

g – group

o - other

Number	Permission	Ref
0	No permission	- - -
1	Execute	- - x
2	Write	- w -
3	Write and Execute	- w x
4	Read	r - -
5	Read and Execute	r – x
6	Read and Write	r w -
7	Read, write, execute	r w x

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- Change owner - chown
- Change Group - chgrp

Pipes and Filters

- grep - searches a file(s) for lines with certain pattern

    $ grep pattern file(s)

- Pipe   allows to combine more than one command in a sequential order - |

    e.g   cat file | more   to view the file screen by screen manner

- Sorting contents of the file - sort

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Regular Expressions

Symbol	Description
.	Replaces any character
*	Matches 0 or more characters
?	Matches one character
^	Matches start of the string
$	Matches end of the string
\	Special character
()	Group of regular expression

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Environment

- When one logs into the system, shell undergoes a phase "initialization", which involves reading files
  - /etc/profile
  - Profile
  - You can set the prompt in /etc/bash.bashrc
- Setting up PATH
  - $ PATH=/bin:/usr/bin
- PS1 – what should be the prompt on shell e.g PS1="[\u@\h \w]\$"

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- When an incomplete command is issued, the shell displays secondary prompt and waits for you to complete the command or press Enter

- Default Secondary prompt is >

- It is stored in PS2

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- Delete file - rm <filename>
- Move or rename a file – mv <filename> <newfilename>
- To convert the regular user permissions to root user permission to perform a privileged task
   sudo
- Print file with line numbers for every line
   pr -n <filename>

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