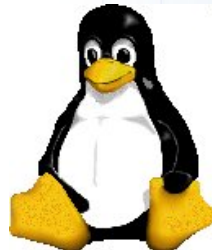




## Using the system



# Unit objectives

After completing this unit, you should be able to:

- Log in and out of the system
- State the structure of Linux commands
- Execute basic Linux commands
- Use Linux commands to communicate with other users
- Use the keyboard and mouse effectively
- Discuss the X Window System

# Linux is multiuser and multitasking

- Linux is a multiuser, multitasking operating system.
  - Multiple users can run multiple tasks simultaneously, independent of each other.
- You always need to log in before using the system.
  - Identify yourself with user name and password.
- There are multiple ways to log in to the system.
  - You can log in through the console: Directly attached keyboard, mouse, monitor.
  - You can log in through a serial terminal.
  - You can log in through a network connection (for example, SSH or Telnet).

# Virtual terminals

- In most Linux distributions, the console emulates a number of virtual terminals (VT).
- Each virtual terminal can be seen as a separate, directly attached console.
  - Different users can use different virtual terminals.
- The following is a typical setup:
  - VT 1 through 6: Text mode logins.
  - VT 7: Graphical mode login prompt (if enabled).
- Switch between VTs with **Alt-Fn** (or **Ctrl-Alt-Fn** if in X).

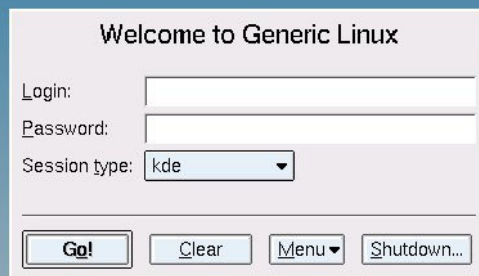
# Logging in: Text mode VT

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```
Welcome to Generic Linux
```

```
dyn1 login: _
```

# Logging in: Graphical mode VT



Welcome to Generic Linux

Login:

Password:

Session type: kde ▼

**Note:** Different distributions and desktop environments will display different login prompts.

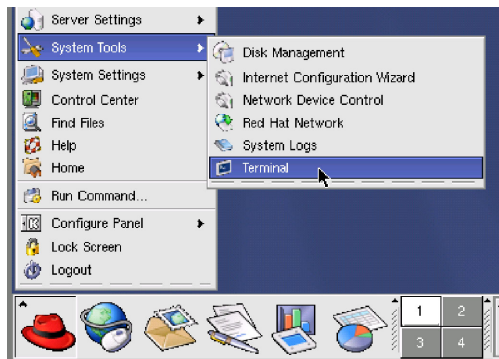
# Linux commands

- Everything on a Linux system can be done by typing commands.
  - Even browsing the World Wide Web
- The graphical user interface (X Window System or X) is not needed for running a Linux system.
  - But is sometimes more convenient
- A terminal emulator will allow you to type commands when using the graphical interface.

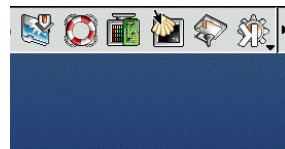
# Starting a terminal emulator

- To run a Linux command inside the X environment, open a terminal window or terminal emulator.
  - Emulates a text console

Red Hat, Fedora:



KDE:



GNOME:



SUSE:





# Command prompt

- The command prompt indicates that the system is ready to accept commands.
- It can be configured yourself (this will be covered later).
  - The default depends on distribution.

- Examples include:

```
[user@host dir]$
```

```
dir$
```

```
$
```

```
#
```

- The dollar sign (\$) usually means you are logged in as a regular user.
- The hash sign (#) usually means you are logged in as root.

# Linux command syntax

- Linux commands have the following format:  
– *\$ command options arguments*

```
$ ls
```

```
$ ls -l
```

```
$ ls /dev
```

```
$ ls -l /dev
```

# Command format examples

- Wrong
- Right

## 1. Separation

```
$ mail - f personal  
$ who-u
```

```
$ mail -f personal  
$ who -u
```

## 2. Order

```
$ mail test root -s  
$ -u who
```

```
$ mail -s test root  
$ who -u
```

## 3. Multiple options

```
$ who -m-u  
$ who -m u
```

```
$ who -m -u  
$ who -mu
```

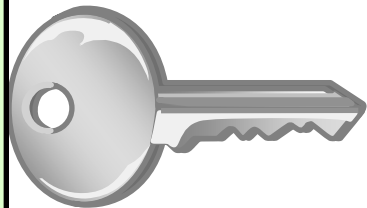
# Some basic Linux commands

- **passwd:** Change your password.
- **date, cal:** Find out today's date and display a calendar.
- **who, finger:** Find out who else is active on the system.
- **clear:** Clear the screen.
- **echo:** Write a message to your own screen.
- **write:** Write a message to other screens.
- **wall:** Write a message to all screens.
- **talk:** Talk to other users on the system.
- **mesg:** Switch reception of write, wall, and talk messages on or off.

# Changing your password

- The **passwd** command allows you to change your password.

```
$ passwd  
Changing password for tux1  
Old password:  
New password:  
Retype new password:
```



- Passwords are important for security, therefore you should choose a good password.
  - Minimum six characters
  - Not a dictionary word, birth date, license plate, and so on

# The date command

- **date** shows the current date and time.

```
$ date
```

```
Mon Jan 1 23:59:59 UTC 2007
```

# The cal command

- **cal** shows a calendar.
- Synopsis: `cal [Month] [Year]`

```
$ cal 1 2007
```

```
January 2007
```

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

```
$
```

# Who is on the system

- **who** shows who is logged onto the system.

```
$ who
```

```
root                tty1                Jan 1   11:10
tux1      tty2                Jan 1   11:04
```

```
$ who am i
```

```
host!tux1           tty2                Jan 1   11:04
```

But:

```
$ whoami
```

```
tux1
```



# Finding information about users

- The **finger** command shows info about other users.
- Synopsis: `finger [user] [@host]`

```
$ finger
```

Login	Name	Tty	Idle	Login	Time
tux1	Tux (1)	2		Jan 1	11:04
root	root	*1	7	Jan 1	11:10

```
$ finger tux1
```

```
Login:
```

```
tux1
```

```
Name:
```

```
Tux (1)
```

```
Directory: /home/tux1 Shell: /bin/bash
```

```
On since Mon Jan 1 11:04 (UTC) on tty2
```

```
No mail.
```

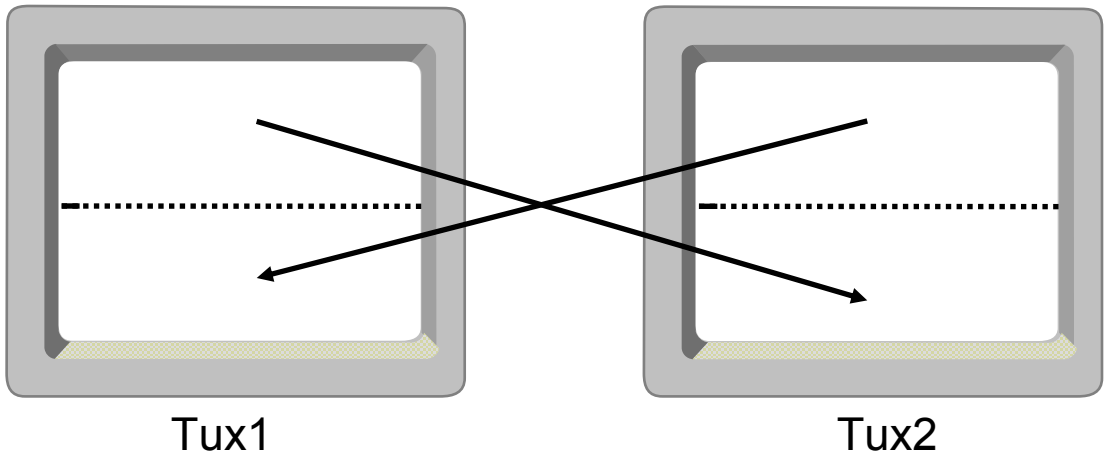
```
No plan.
```

# The clear, echo, write, and wall commands

- The **clear** command clears your screen.  
`$ clear`
- The **echo** command writes messages to your own screen.  
`$ echo Who wants to go to lunch?`  
`Who wants to go to lunch?`
- Use **write** to display a text message on a user's terminal.  
`$ write tux2`  
`Message`  
`<ctrl-d>`
- Use **wall** to place a message on all logged-in users' displays.  
`$ wall`  
`I'm back`  
`<ctrl-d>`

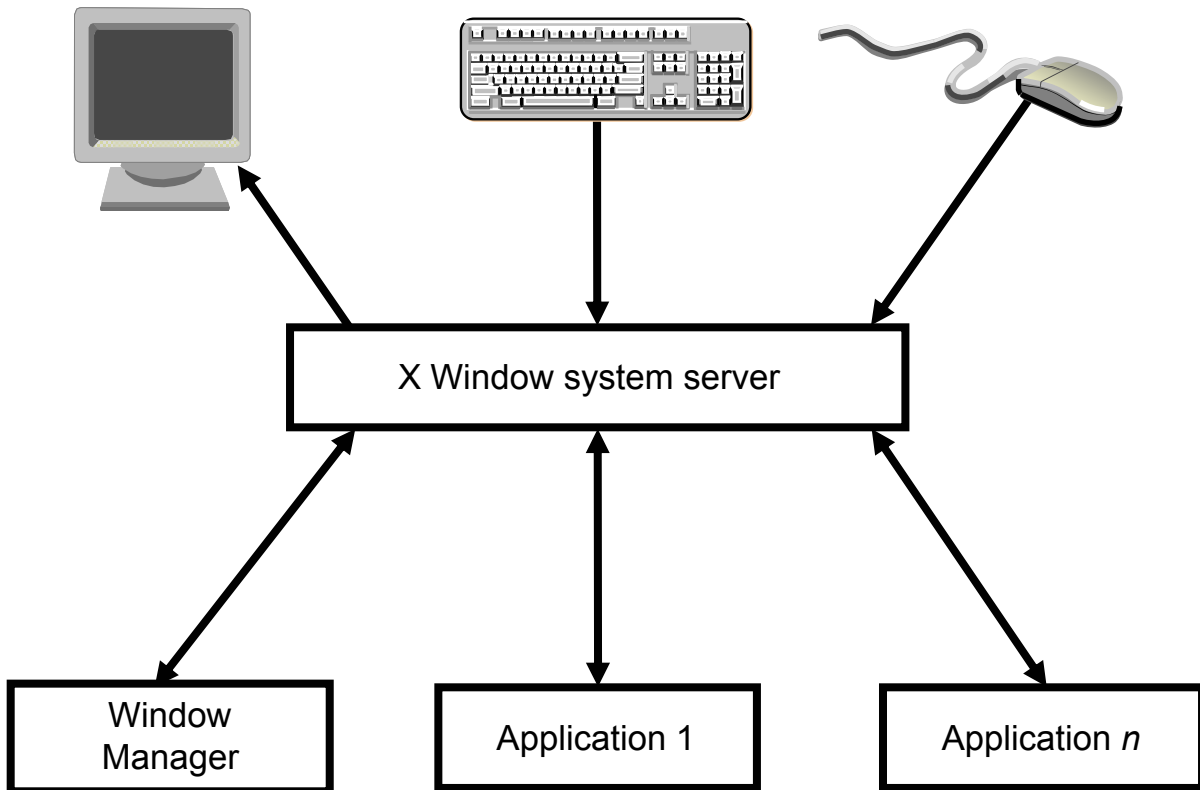
# Talk with another user

- If Tux1 wants to talk with Tux2, Tux1 enters:  
– `$ talk tux2`
- If Tux2 also wants to talk with Tux1, Tux2 enters:  
– `$ talk tux1`



# X Architecture: Overview

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# X components

- An X server
  - Controls keyboard, mouse, and one or more screens
  - Controls resolution, refresh rate, and color depth
  - Allows simultaneous access by several clients
  - Performs basic graphic operations
  - Forwards keyboard and mouse events to the correct clients
- An X client
  - Is, for instance, an application
  - Receives keyboard and mouse inputs from server
  - Sends output to be displayed to server
- A Window Manager
  - Performs window dressing on other clients
  - Is a special X client
  - Allows other client windows to be moved, iconified, and so forth

# X configuration

- Xorg is the most commonly used X server.
- The Xorg X server needs to be configured for your hardware.
  - Keyboard, mouse
  - Graphical adapter
  - Monitor
- Things to configure include refresh rate, resolution, and color depth.
- Config file is `/etc/X11/xorg.conf`.
- Manual configuration is possible, but it is hard.
  - [www.x.org/wiki/ConfigurationHelp](http://www.x.org/wiki/ConfigurationHelp) for details on Xorg configuration
- Automated configuration tools are available.
  - During installation of distribution
  - Distribution tools: `system-config-display` (RHEL and Fedora), `sax2/yast2` (SLES)
  - Xorg tool: `xorg -configure`

# Desktop environments

- A desktop environment is:
  - A set of tools, libraries, and standards that allows rapid development of X clients
  - A set of X clients (including one or more window managers) that are developed with these tools, libraries, and standards
- There are two popular desktop environments:
  - GNU Network Object Model Environment (GNOME)
  - K Desktop Environment (KDE)
- Advantages of desktop environments include:
  - Integration (cut and paste through clipboard and drag and drop)
  - Common look (themes)

# K Desktop Environment

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# The GNOME desktop environment

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# Which desktop environment?

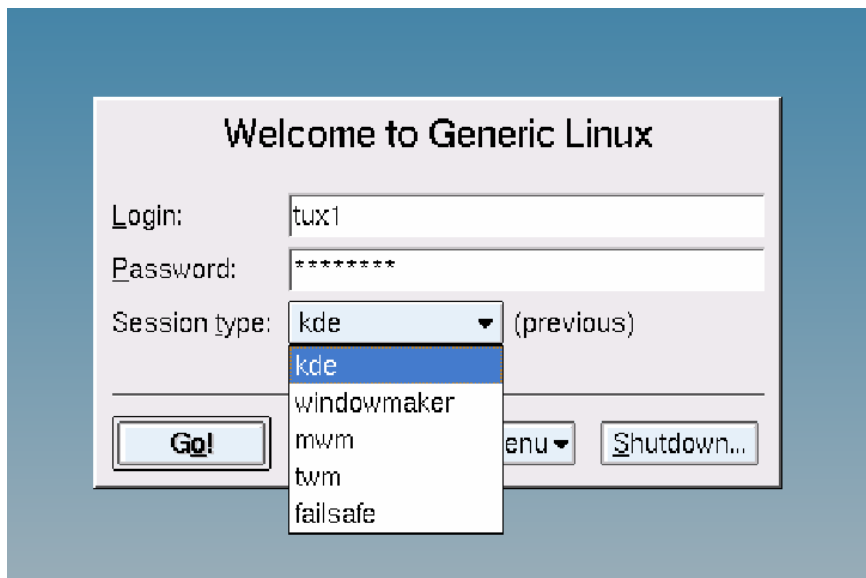
- Most distributions can provide both KDE and GNOME.
- If multiple environments are installed, the graphical login prompt can allow you to choose which desktop environment to use.
- KDE and GNOME are a collection of packages, all of which can be changed out depending on preference.
  - Default window managers: GNOME: metacity / KDE: kwin
- Applications are not locked to a particular environment. KDE or GNOME libraries (or both) are available to be used by any application.
- Freedesktop.org is working to standardize shared technology for X Window systems.
- To decide, try them all. Customize them. Find what works best for you.

# Starting X

- If logged in on a text terminal, run `startx`.
  - This only starts a single session.
  - When the session ends, you are back in your text terminal.
- If you want to enable the graphical login screen, bring the system into runlevel 5.
  - To switch manually, use **`init 5`** command.
  - To make the change permanent, edit `/etc/inittab`:  
`id:5:initdefault:`

# Choosing your desktop environment

- Most distributions provide multiple desktop environments.
- To choose between them, select from the login prompt.
- Users can have their own preference.



# Unit review

- Linux includes both a text and GUI interface.
- Linux commands have a common syntax. There are many useful command line tools that are available by default.
- The GUI of Linux is based on the X Window System (X for short). X uses a client-server model.
- The most common X server under Linux is Xorg.
- The desktop environment is a series of tools, libraries, and standards that allow development of X clients and a set of X clients developed with this.
- The most common desktop environments on Linux are KDE and GNOME.

# Checkpoint

1. True or False: A Linux system always needs a graphical user interface.
2. Which of the following commands is not a legal command in Linux?
  - a. `ls/dev/bin`
  - b. `ls -al/dev/bin`
  - c. `ls -a -l .`
  - d. `ls -a-l/dev`
3. How do you switch between virtual terminals?

# Checkpoint solutions

1. True or False: A Linux system always needs a graphical user interface.

The answer is false.

2. Which of the following commands is not a legal command in Linux?

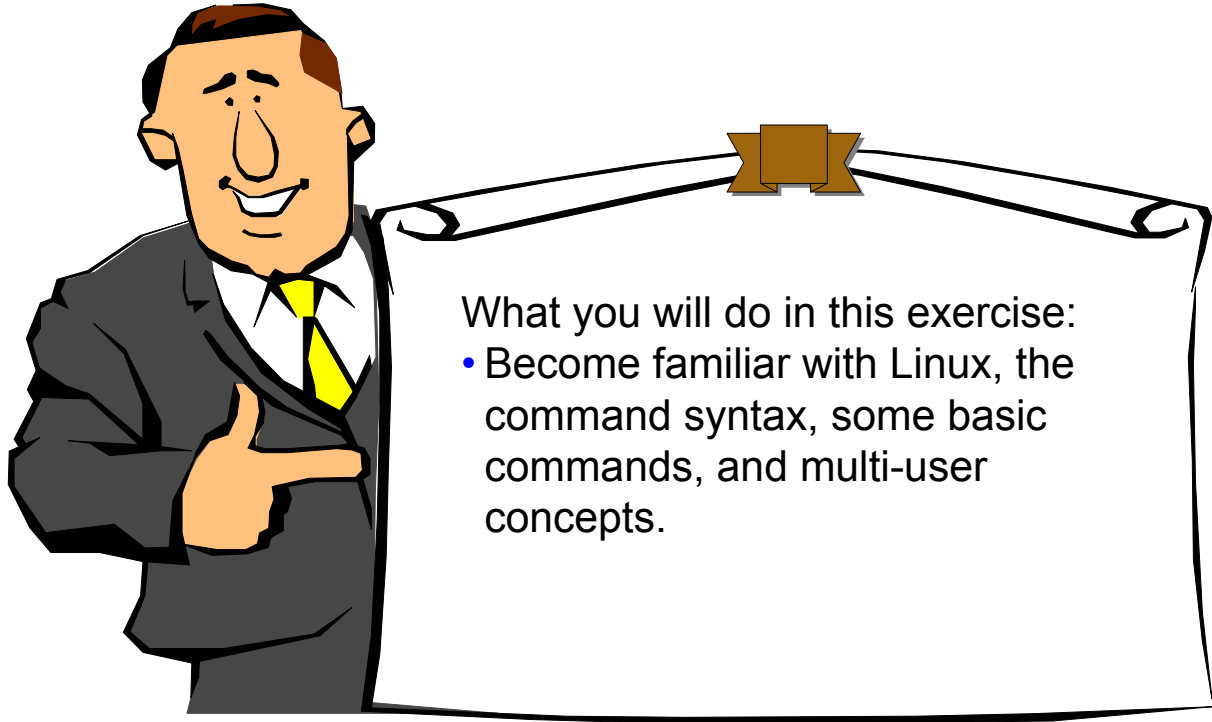
- a. ls/dev/bin
- b. ls -al/dev/bin
- c. ls -a -l .
- d. ls -a-l/dev

The answer is ls/dev/bin, ls -al/dev/bin, and ls -a-l/dev are all illegal commands.

3. How do you switch between virtual terminals?

The answer is by entering the key combination **Alt-Fn** or, when in X, **Ctrl-Alt-Fn**.

# Exercise: Using the system





# Unit summary

Having completed this unit, you should be able to:

- Log in and out of the system
- State the structure of Linux commands
- Execute basic Linux commands
- Use Linux commands to communicate with other users
- Use the keyboard and mouse effectively
- Discuss the X Window System