LINUX

WHERE USERS GET SUPER POWER

SESSION - I

Course Objective

- To get the skill set of system administrators on RHEL 7
- To get hands on practices on RHEL 7

Session 1 – Agenda

- History of Linux / Unix
- Linux Distribution and Architechture

Time : 20 mins

History of UNIX

- The Parent OS of Linux
- First version of unix was developed in 1969 by Kenneth Thompson and Dennis Ritchie
- Written in **C** and **Assesmbly Language**
- **System V** Unix developed by AT&T
- The **Berkeley Software Distribution** (**BSD**) was based on the source code of the original Unix developed at Bell Labs
- Sun Solaris was actually BSD-based Unix called SunOS
- Hewlett-Packard created HP-UX for their workstations
- AIX owned by IBM (Advanced Interactive eXecutive).

Still you have no idea what is an OS wait for it.

History of LINUX

- Thanks to Linus Torvalds for creating free operating system kernel.
- 1983 – Richard Stallman wrote the GNU GPL (General Public License)
- 1991 – Linus Torvalds began a project Linux kernel 0.01
- Linux is popular because of its online community where Linux developers from all over the universe send in their suggestions and feedback about improving the scope of OS.
- Companies like Dell, HP, IBM invest their resources in the advancement of Linux OS.

For more history: https://en.wikipedia.org/wiki/History_of_Linux

What is Linux

- Linux is a free open source OS, which anyone can run, study, modify and redistribute the source code under the (GNU GPL) license.

Open Source (OSS)

- Open Source Software (OSS) is code that is designed to be publicly accessible where, anyone can see, edit and distribute.
- The best part of Linux is that its source code is available as it is in FOSS (Free and Open Source Software) category.

Why Linux?

- Open Source
- High Security
- High Stability
- Run on any Hardware
- Application Support
- Linux Community

- Multi Programming
- Multi Threading
- Multi Processing
- Multi Tasking (Interrupt Handling - DAM)
- Multi User (Unix)

Click Next to see the statistics

Why Linux?..

- In 2021, Linux ran on 100% of the world's 500 super computers.
- 96.3% of the servers that run the world's top 1 million domains are powered by Linux. Only 1.9% use Windows, and 1.8% – FreeBSD.
- 85% of all smartphones based on Linux.
- Android based on the modified version of Linux Kernel.
- The top 25 websites in the world, only 2 aren't using Linux.
- 90% of the public cloud workload runs on Linux.
- 90% of Hollywood's special effects are made on Linux.
- A lot more on the list Governments, Military, Banks, etc.,

Tell me why not Linux?

Advantages of Linux over Windows

1. Open Source Free to use.
2. Secure

Windows OS is vulnerable to many types of attacks. It doesn't mean Linux isn't vulnerable, but it is a lot more secure. The way Linux works that makes it a secure OS. The process of Package Management, concept of repositories and a couple more features are the reason.

3. Upgrade Older Computers

As the OS getting upgrade, so do their hardware requirements. Linux requires 20GB of Hard Drive space and 1GB of RAM is good enough to run a server (Minimal Version).

4. Over 600 Linux Distros Available, where in windows ??
5. Customization
6. Better Community Support

DIFFERENT OS AND FLAVOURS

- Widely used distributions are:
  - Ubuntu
  - Fedora
  - Mint
  - CentOS
  - PCLinuxOS
  - Slackware
- Lightweight distributions:
  - Alpine
  - Absolute
  - CoreOS
  - ArchBang
  - Feather Linux

https://en.wikipedia.org/wiki/List_of_Linux_distributions

LINUX DISTROS..

- Red Hat Enterprise Linux – developed by Red Hat for the commercial market.
- Fedora – Community supported Fedora project sponsored by Red Hat
- OpenSUSE – open source OS developed and supported by openSUSE project.
- Debian – A GNU / Linux composed of free and open source software, developed by community supported Debian project.
- Ubuntu – based on Debian composed of free and open source software.

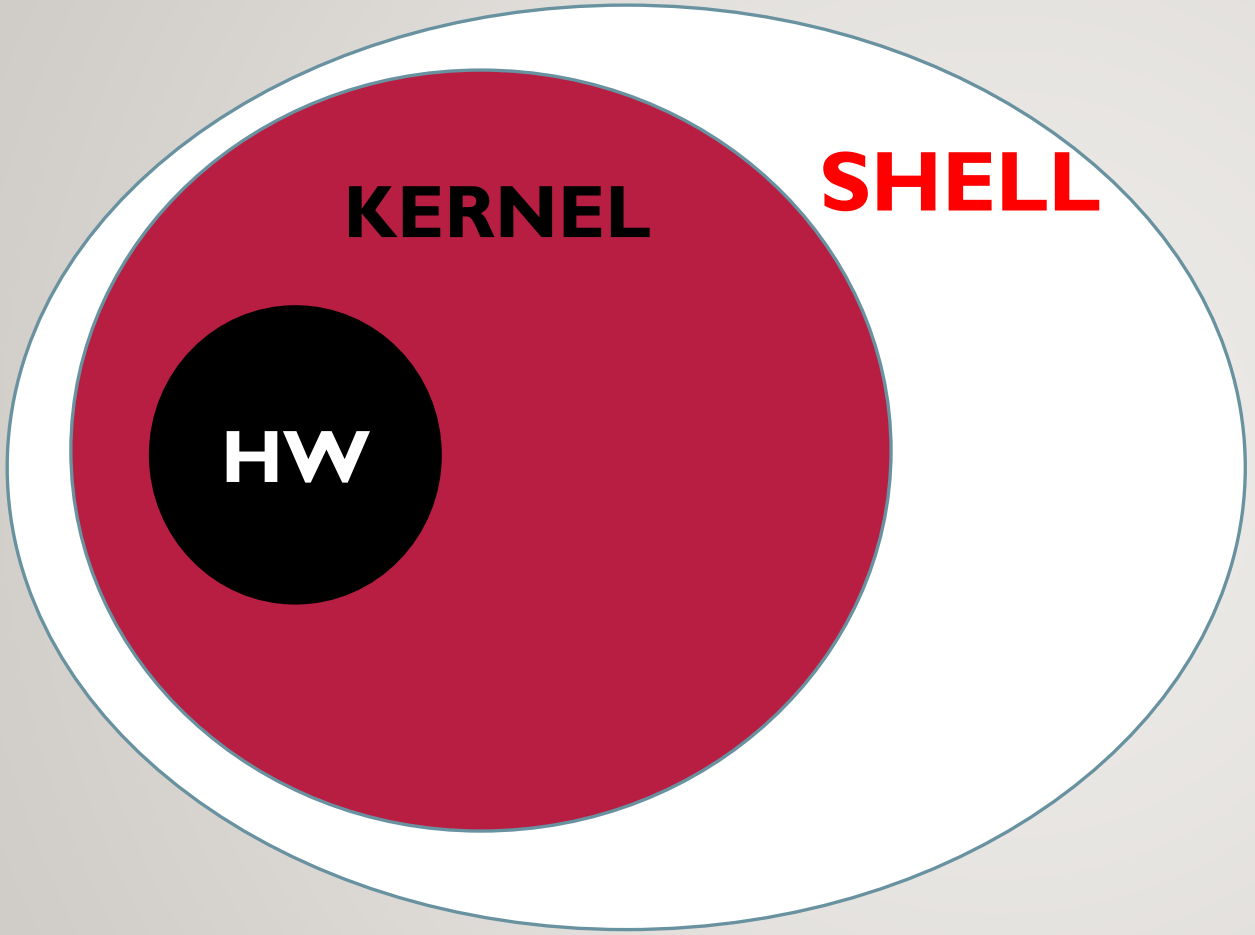
Note: In this course we work only on Red Hat Enterprise Linux – Version 7.

Architecture of OS

An Operating system is an interface between Hardware and Software.

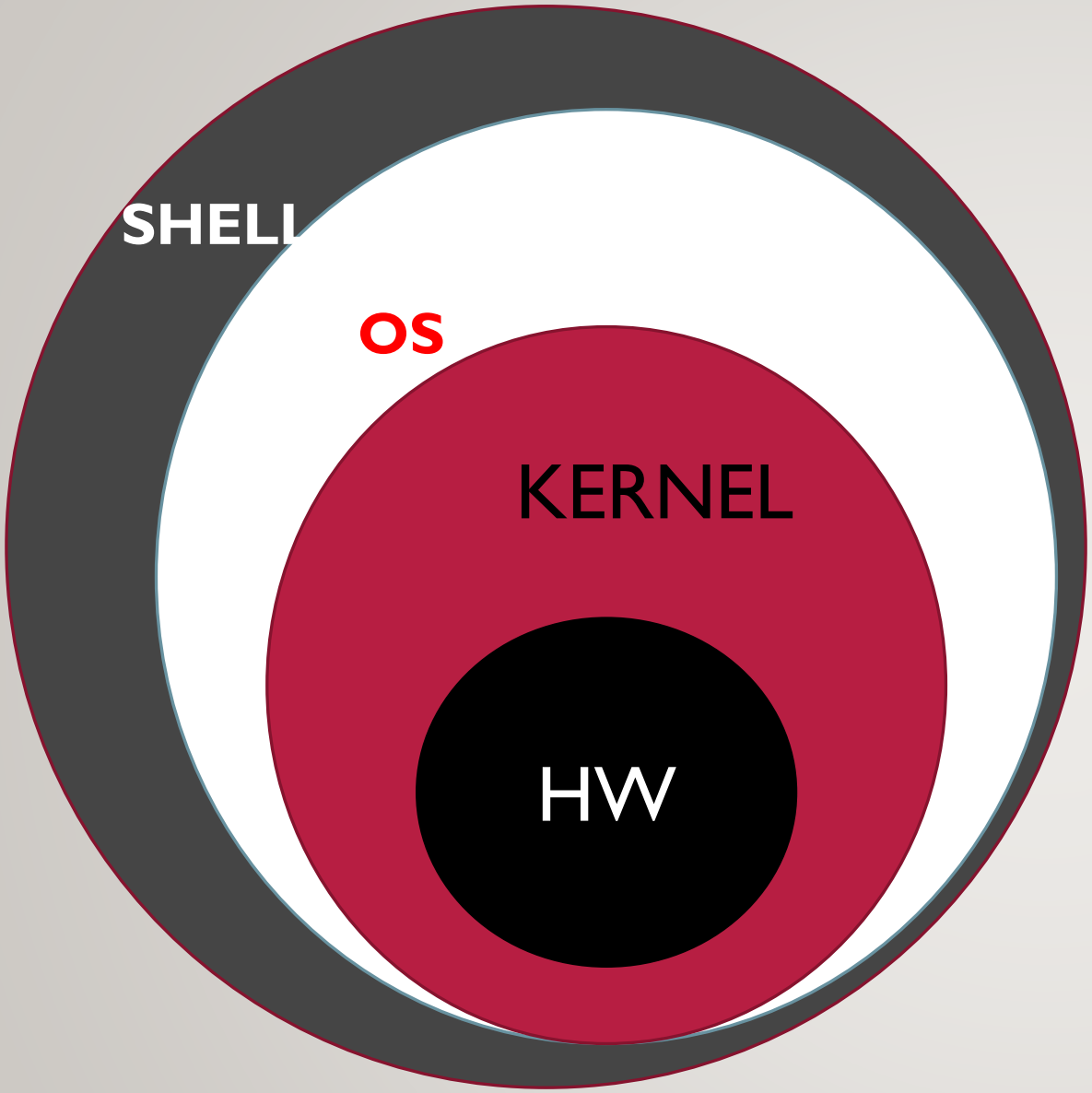
- Software (SW) can be System SW or Application SW
- Hardware includes CPU, RAM, I/O, etc.,

KERNEL ARCHITECTURE



LINUX

- MINIX
- UBUNTU
- KALI
- SUSE
- YELLOW DOG
- REDHAT
- FEDORA
- CENTOS



UNIX

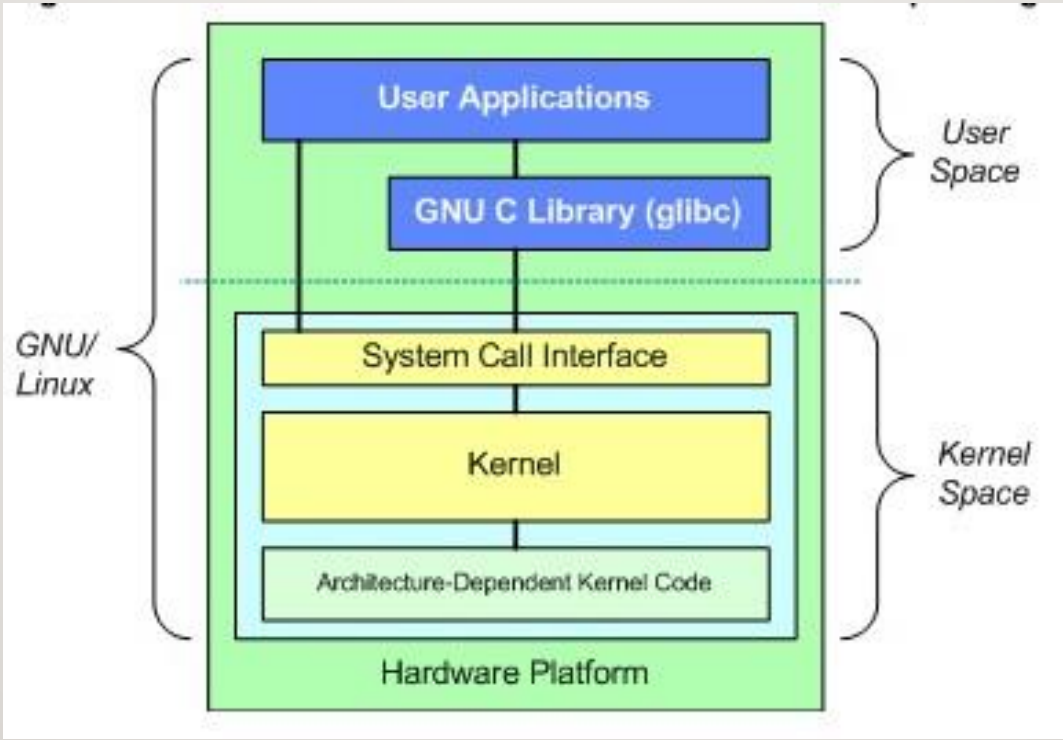
- AIX - IBM
- SOLARIS
- BSD400
- HP-UIX
- OS X
- GNU / LINUX (FSF)

- SHELL (GUI & CLI) – It is an interface which takes input from the users and sends instruction to the kernel.
- OS – An Operating System is a software which performs all the basic tasks like Memory, Process and File management, etc.,
- Kernel – The core component for any operating system which directly interacts with the hardware.
- Hardware – Physical devices attached to the system like HDD, RAM, Motherboard, CPU, etc.,

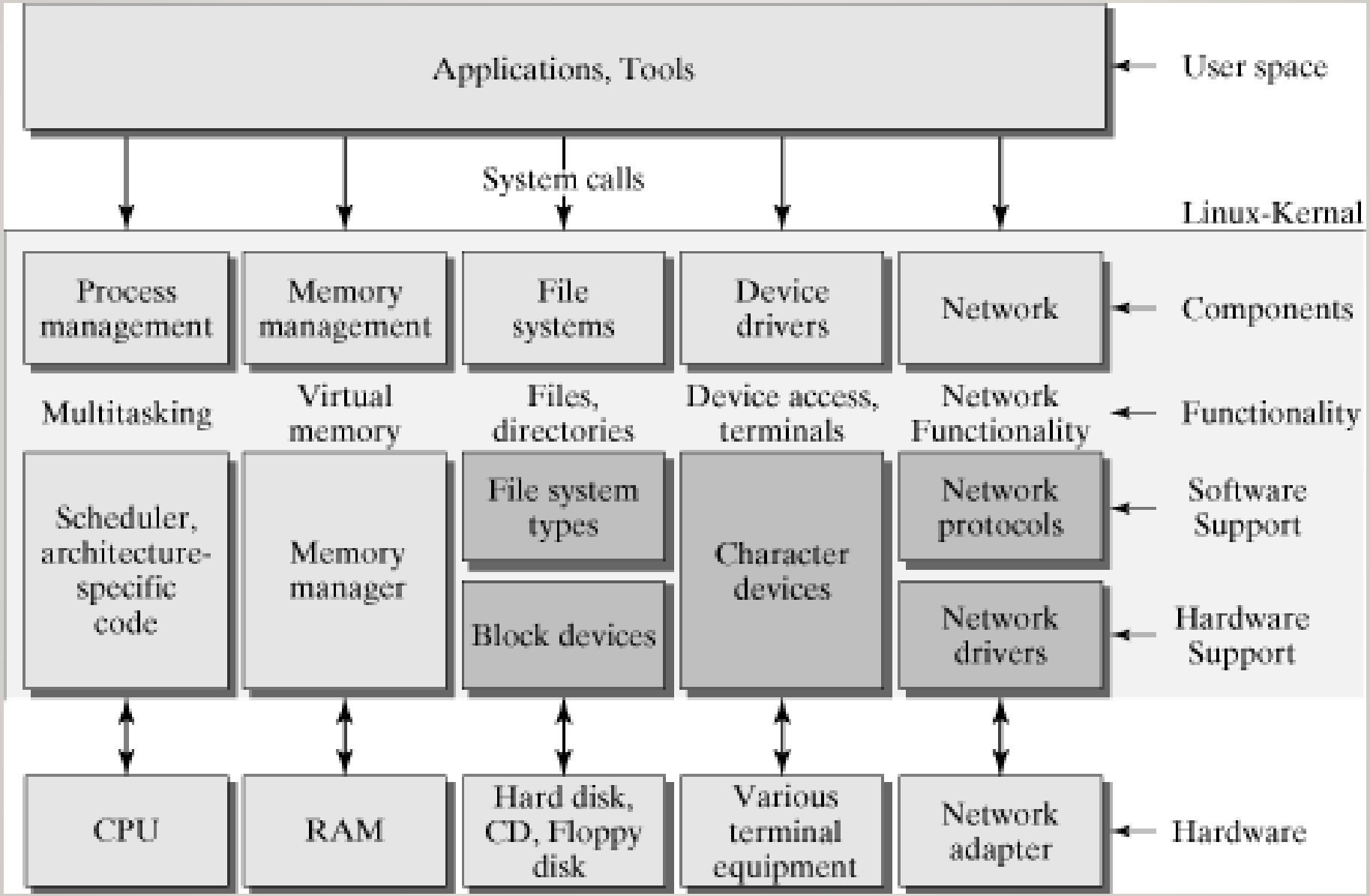
What is Kernel?

- A Kernel is a program which is the heart and core of an operating system.
- The core interface between the processes and a computer hardware.

The Architecture is divided into two as User Space and Kernel Space



What kernel does?



What Kernel does?

- File Management – Organizing and tracking files and directories (Folders).
- Process Management – Decides which processes can utilize CPU, when and for how long.
- Memory Management – tracks how much memory is utilized for storage and to store what, where.
- Device Drivers – Act as a mediator between hardware and processes.

Summary of Session 1

- What is Linux?
- History of Unix / Linux
- Why Linux?
- Linux Distros
- What is Kernel ?
- Kernel Architecture
- What kernel does?

Quiz time: