

**Activity Report
(Guest lecture on Operating System)**

Academic Year: 2020-21 (SemI)

Name of Event:

Guest Lecture

Topic:

Linux Operating System Internals

Date & Time of Conduction:

11th November 2020 (12 pm to 2.30 pm)

Targeted Audience:

Third Year Students

Venue:

Online session

Coordinator:

Prof. Bhavana Kanawade

Number of Participants:

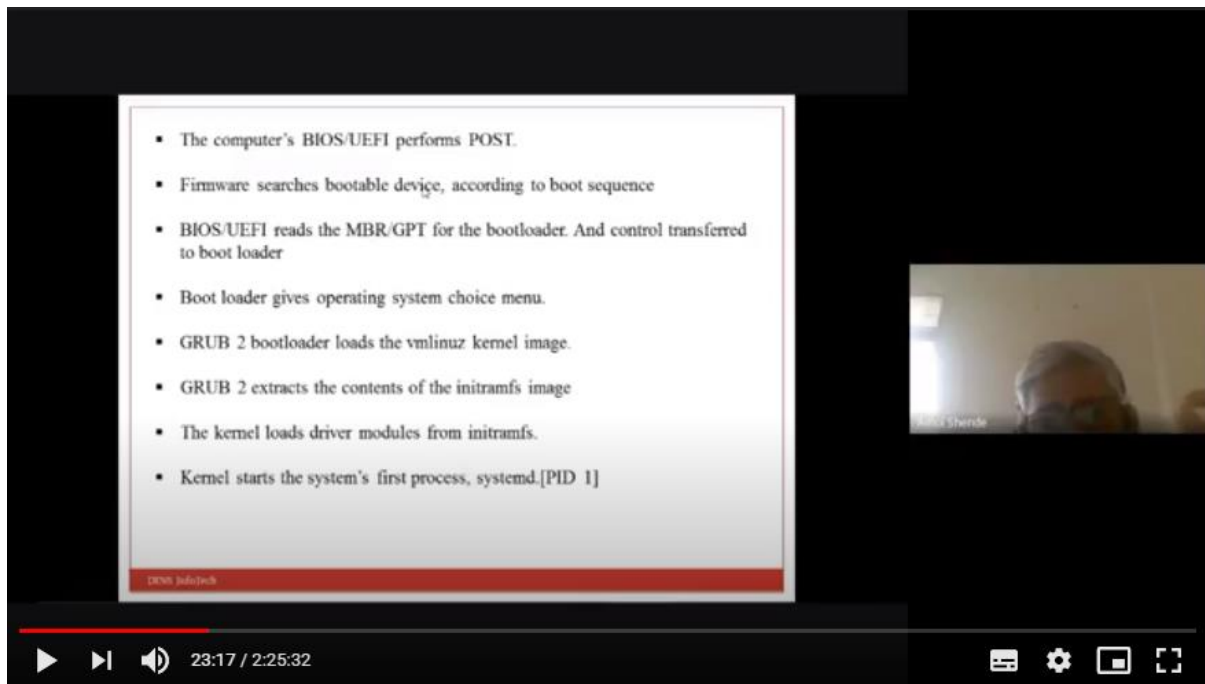
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Activity Description in Nutshell:

Mr. Amol Shende conducted the session on the specified topic. The speaker covered topics like Linux booting process, repair system boot issues, user and group administration, Linux file system.

Event Photos:

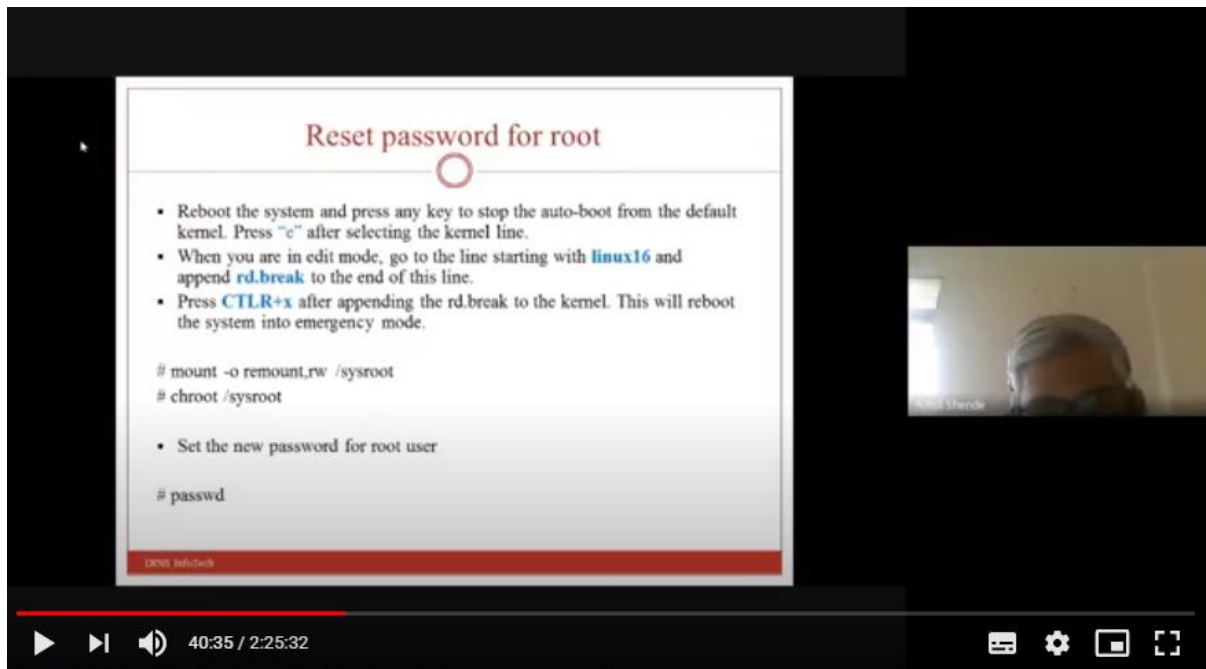
Explanation of Linux Booting Process



The screenshot shows a video player interface. On the left, a white box contains a bulleted list of steps in the Linux booting process. On the right, a small video window shows the speaker, Mr. Amol Shende. The video player controls at the bottom show the video is at 23:17 of a 2:25:32 duration.

- The computer's BIOS/UEFI performs POST.
- Firmware searches bootable device, according to boot sequence
- BIOS/UEFI reads the MBR/GPT for the bootloader. And control transferred to boot loader
- Boot loader gives operating system choice menu.
- GRUB 2 bootloader loads the vmlinuz kernel image.
- GRUB 2 extracts the contents of the initramfs image
- The kernel loads driver modules from initramfs.
- Kernel starts the system's first process, systemd.[PID 1]

Demonstration on how to repair system boot issues



The screenshot shows a video player displaying a slide titled "Reset password for root". The slide contains the following instructions:

- Reboot the system and press any key to stop the auto-boot from the default kernel. Press "c" after selecting the kernel line.
- When you are in edit mode, go to the line starting with **linux16** and append **rd.break** to the end of this line.
- Press **CTRL+x** after appending the rd.break to the kernel. This will reboot the system into emergency mode.

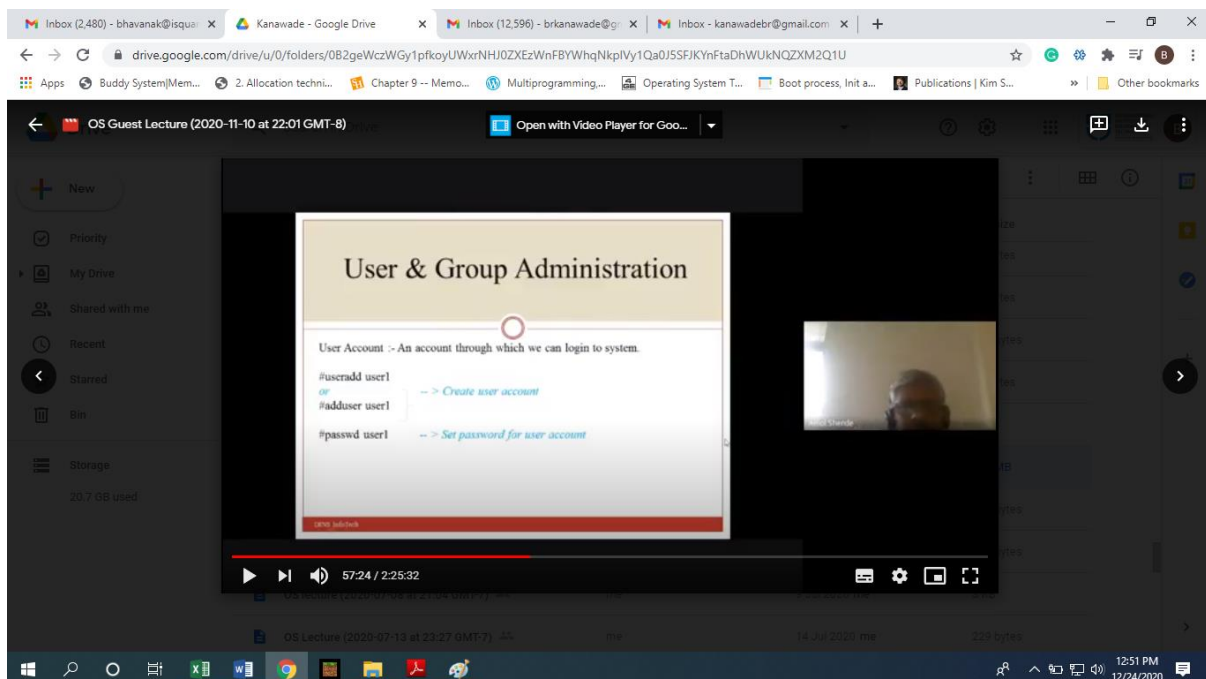
```
# mount -o remount,rw /sysroot
# chroot /sysroot
```

- Set the new password for root user

```
# passwd
```

The video player interface shows a progress bar at 40:35 / 2:25:32 and various control icons.

Demonstration of User and group administration



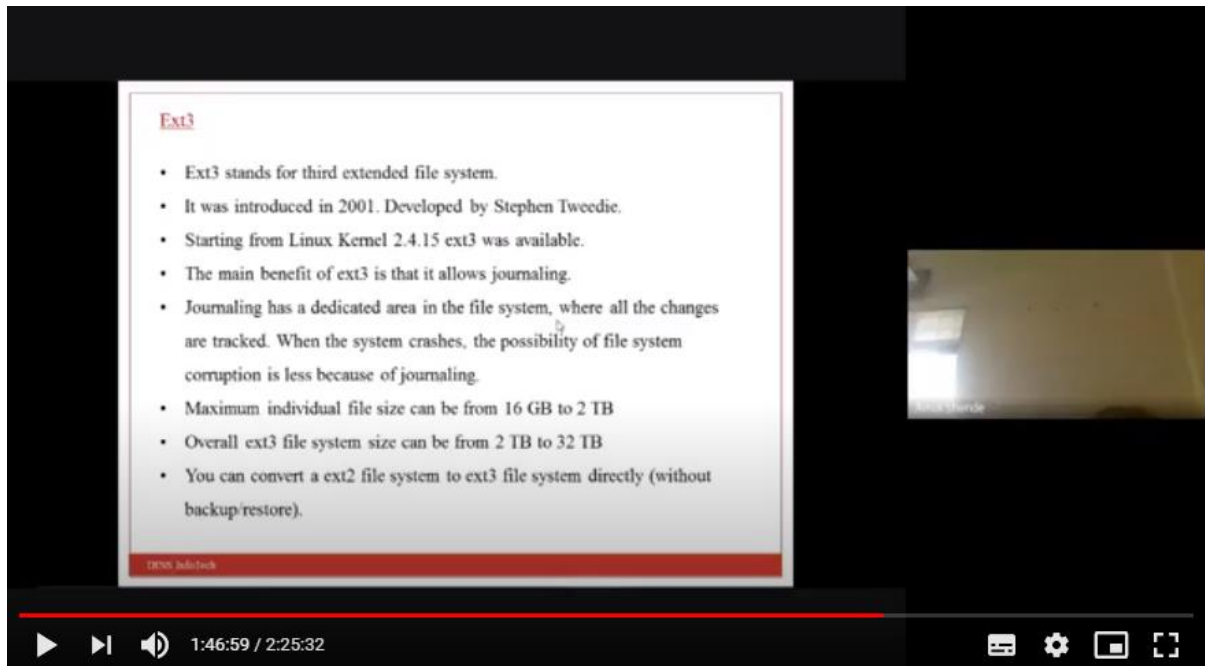
The screenshot shows a video player displaying a slide titled "User & Group Administration". The slide contains the following text:

User Account - An account through which we can login to system.

```
#useradd user1 --> Create user account
or
#adduser user1
#passwd user1 --> Set password for user account
```

The video player interface shows a progress bar at 57:24 / 2:25:32 and various control icons. The background shows a Windows taskbar with the date 12/24/2020 and time 12:51 PM.

Explanation of Linux file system



The image shows a video player interface. The main content is a slide titled "Ext3" with a list of bullet points. The video player controls at the bottom show a play button, a progress bar at 1:46:59 / 2:25:32, and icons for settings, full screen, and a small inset video window on the right side.

Ext3

- Ext3 stands for third extended file system.
- It was introduced in 2001. Developed by Stephen Tweedie.
- Starting from Linux Kernel 2.4.15 ext3 was available.
- The main benefit of ext3 is that it allows journaling.
- Journaling has a dedicated area in the file system, where all the changes are tracked. When the system crashes, the possibility of file system corruption is less because of journaling.
- Maximum individual file size can be from 16 GB to 2 TB
- Overall ext3 file system size can be from 2 TB to 32 TB
- You can convert a ext2 file system to ext3 file system directly (without backup/restore).

1:46:59 / 2:25:32