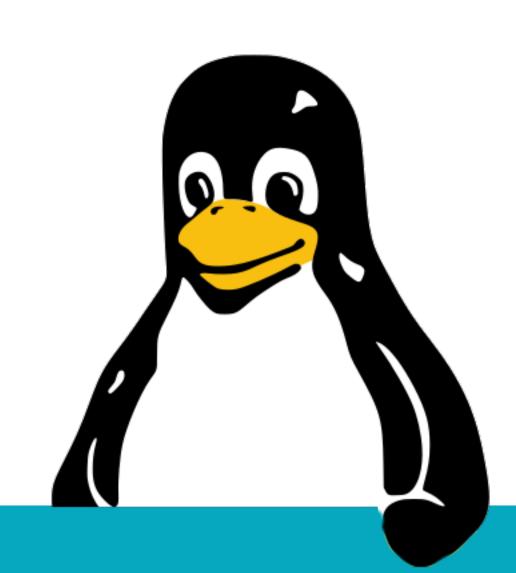
Linux, day 7





LAB: The Linux boot process





Fedora: enable boot menu

- Edit "/etc/default/grub" and set these (no quotes!):
 - GRUB_TIMEOUT=5
 - GRUB_TIMEOUT_STYLE=menu
 - GRUB_TERMINAL=console
 - GRUB_TERMINAL_OUTPUT=console
- Then run:
 - sudo grub2-mkconfig -o /boot/grub2/grub.cfg
 - sudo grub2-mkconfig -o /boot/efi/EFI/fedora/grub.cfg



Ubuntu: enable boot menu

- Edit "/etc/default/grub" and set these (no quotes!):
 - GRUB TIMEOUT=5
 - GRUB TIMEOUT STYLE=menu
 - GRUB_TERMINAL=console
 - GRUB_TERMINAL_OUTPUT=console
- Then run:
 - sudo grub-mkconfig -o /boot/grub/grub.cfg



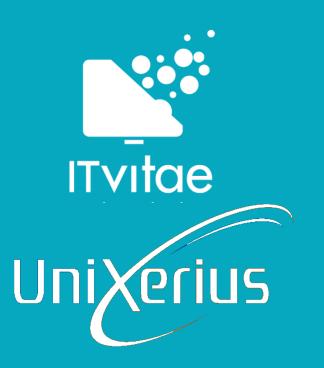
Seeing the bootup

- Some Linuxen have "splash screens" or quiet boot.
- Reboot your VM and interrupt the GRUB2 menu.
- Select the default kernel, then press "e" to edit.
 - Remove the words "quiet", "rhgb" and "splash".
 - Continue booting

Logs once the host is up

```
$ dmesg | less
$ journalctl --list-boots
                                 # Modern
$ journalctl -b
                                 # Modern
$ tail -500 /var/log/messages
                                 # Older
  tail -500 /var/log/syslog
```

LAB: The Linux boot process





(T) I've lost my root!

- Oh no! We're locked out of our root account!
 - And our system refuses to boot.
- How we fix this, differs per distro...
- For safety, first make a snapshot of your VM.

Again, a warning!!

• For safety, first make a snapshot of your VM.



RHEL, CentOS, Fedora (1)

- Reboot your VM and go into the GRUB2 editor.
- Edit the line with boot parameters:
 - Remove "quiet" and "rhgb"
 - Add "init=/bin/sh"
- Boot up...
- Mount / as writable: "mount -o rw,remount /"

RHEL, CentOS, Fedora (2)

- Go into /etc.
- Make a backup copy of the "shadow" file.
- Either Run: "passwd root"
- Or use nano or vi to blank-out the root password.
- Run: "touch /.autorelabel"

See: SELinux and passwd in rescue mode

RHEL, CentOS, Fedora (3)

- Run: "sync; sync; mount -o ro,remount /"
- Reboot, or reset the VM

- Test your root account afterwards.
 - The password should be blank/empty.

Debian, Ubuntu, Kali (1)

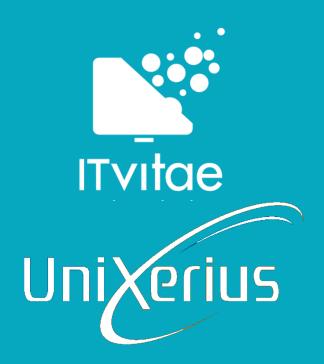
- Reboot your VM and go into the GRUB2 editor.
- Edit the line with boot parameters:
 - Remove "quiet" and "rhgb"
 - Add "init=/bin/bash"
- Boot up...
- Mount / as writable: "mount -o rw,remount /"

Debian, Ubuntu, Kali (2)

- Go into /etc.
- Make a backup copy of the "shadow" file.
- Run: "passwd root",
 - Or edit "/etc/shadow" with vi/nano.
- Run: "sync; sync; mount -o ro,remount /"
- Reboot
- Test your new root password afterwards.



LAB: Kernel modules





Assignment

- Shutdown your VM.
- Add a new NIC to your VM (in Virtualbox).
 - You can put it in the NAT network.
 - This time, use another hardware type! Not e1000.

Assignment

- Boot the VM again.
- Check with "dmesg" if the hardware was seen.
 - Check if the right driver was loaded.
- Check with "Ismod" if you can see the driver.

Closing



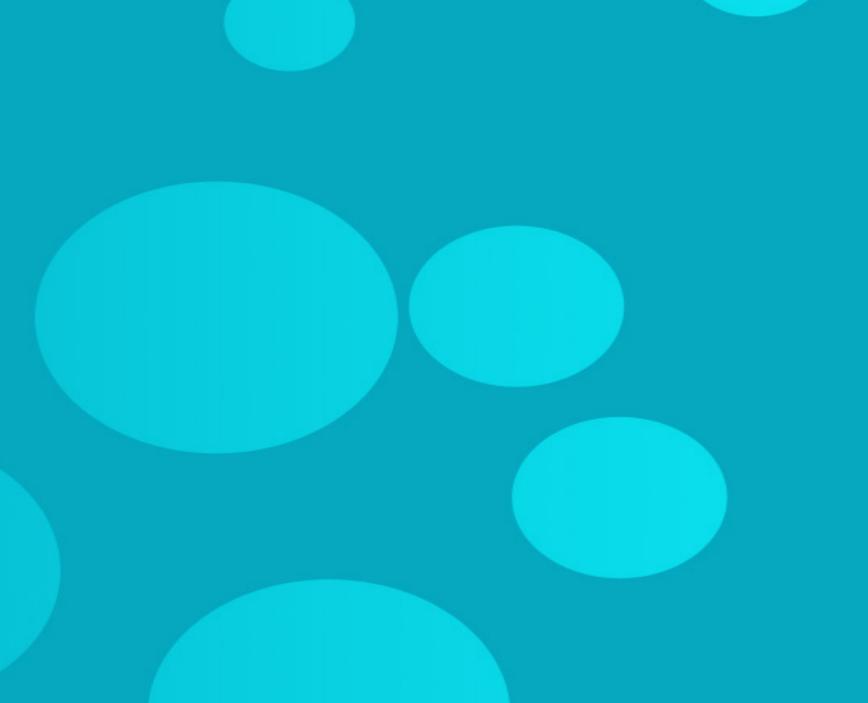


Homework

- Go do:
 - Check your VMs: how many kernels do they have?
 - Install a second, or third kernel version.
 - Use GRUB2 to test booting the installed kernel.

Reference materials





Resources

- Don't use NSCD
- Anatomy of a Linux DNS lookup
- The Linux boot process
- Step by step: Linux boot process explained
- EFI System Partition
- Initramfs, Dracut and the Dracut rescue shell

Resources

- Changing GRUB entries at boot
- Resetting passwords in single-user-mode
- SELinux and passwd in rescue mode
- What is the Linux kernel and what does it do?