



Bloque I: Introducción a Administración e Configuración de Sistemas

- *1.1. Introducción a Linux*
- *1.2. Xestión de usuarios*
- ***1.3. O sistema de arranque de Linux***
- *1.4. Sistema de arquivos de Linux*
- *1.5. Outras tarefas administrativas: copias de seguridade, tarefas programadas, control de procesos, ...*



Arranque do sistema en Linux



Proceso de arranque

- BIOS->MBR do disco de arranque->Grub2
 - UEFI -> tabla GPT (partición EFI) -> Grub2
- Grub2-> Carga o kernel de linux
- Kernel -> /sbin/init => upstart => Systemd
 - <https://wiki.ubuntu.com/SystemdForUpstartUsers>
- Init -> Inicializa os “jobs” e pasa ao “runlevel” por defecto
 - Arranca a “root unit” (default.target = runlevel)

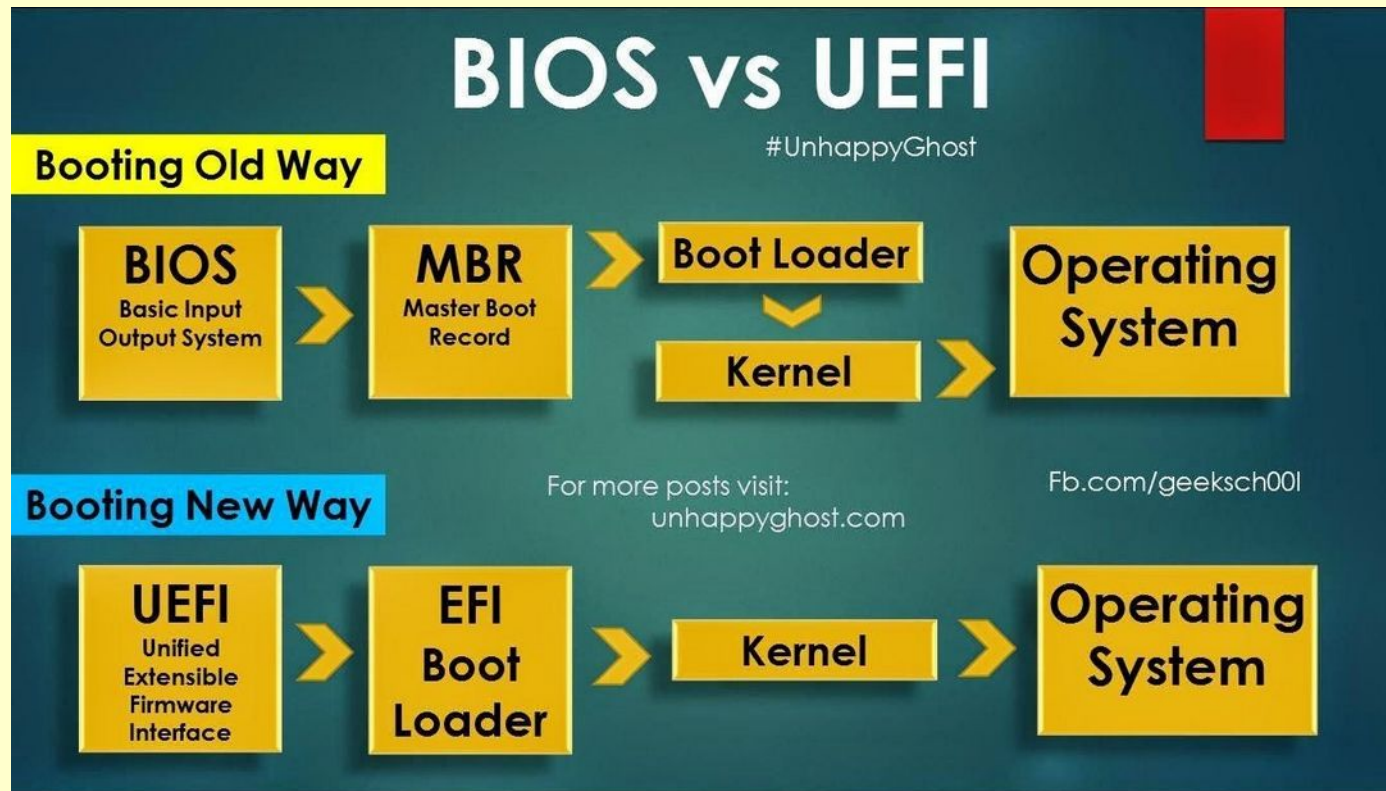
1

2

3

4

Proceso de arranque



https://en.wikipedia.org/wiki/Unified_Extensible_Firmware_Interface
<http://www.thegeekstuff.com/2011/02/linux-boot-process/>
<https://help.ubuntu.com/community/UEFI>

UEFI e GPT



- O código almacenado na BIOS (NVRAM) contén un xestor de arranque (EFI boot manager)

BootCurrent: 000E

Timeout: 5 seconds

BootOrder: 000E,0014,000A,000F,000D,000C,0010,000B,0000,0001,0002,0003,0004,0005,0006,0007,...

Boot0000 Startup Menu FvVol(a881d567-6cb0-4eee-8435-2e72d33e4b5)/FvFile(9d8243e8-8381-...

...

Boot0008 Boot Menu FvVol(a881d567-6cb0-4eee-8435-2e72d33e4b5)/FvFile(9d8243e8-8381-...

Boot0009 HP Recovery FvVol(a881d567-6cb0-4eee-8435-2e72d33e4b5)/FvFile(9d8243e8-8381-...

Boot000A USB: PciRoot(0x0)/Pci(0x14,0x0)N.....YM....R,Y..0..ISPH

Boot000B* Intel Corporation: Realtek PXE B01 D00 B5...etwork,Intel Corporation: Realtek PXE ...

...

Boot000E* ubuntu HD(1,GPT,9719b4d5-ef16-4607-ab57-064117d37948,0x800,0xb4000)/File(\EFI\ubuntulshimx64.efi)

Boot000F* hp HLDS DVDRW GUD1N PciRoot(0x0)/Pci(0x17,0x0)/Sata(1,0,0)N.....YM....R,Y..0..ISPH

Boot0010* hp HLDS DVDRW GUD1N BBS(CDROM,hp HLDS DVDRW GUD1N,0x400)/PciRoot(0x0)/...

...

Boot0012* IPV4 Network - Realtek PCIe GBE Family Controller PciRoot(0x0)/Pci(0x1c,0x0)/Pci(0x0,0x0)/...

...

Boot0014* Windows Boot Manager HD(1,GPT,9719b4d5-ef16-4607-ab57-064117d37948,0x800,0xb4000)/File(\EFI\Microsoft\Boot\bootmgfw.efi)WINDOWS.....

UEFI e GPT



```
sudo fdisk /dev/sda
```

Disk /dev/sda: 931,5 GiB, 1000204886016 bytes...

Units: sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 4096 bytes

I/O size (minimum/optimal): 4096 bytes / 4096 bytes

Disklabel type: gpt

Disk identifier: E789C81A-24B3-4387-BDEA-FC8A536541FD

Device	Start	End	Sectors	Size	Type
/dev/sda1	2048	739327	737280	360M	EFI System
...					

```
df -h
```

/dev/sda1	356M	99M	258M	28%	/boot/efi
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- A partición EFI contén aplicacións UEFI (*.efi)
 - **shimx64.efi (grubx64.efi)**
 - **bootmgfw.efi**
- Poderíamos omitir o paso intermedio do cargador grub e cargar directamente o kernel de Linux (*EFI stub loader*)

GRUB2



- Cargador por defecto en Ubuntu desde la versión 9.10
 - Archivo de configuración `/boot/grub/grub.cfg`

```
# DO NOT EDIT THIS FILE
#
# It is automatically generated by /usr/sbin/grub-mkconfig using templates
# from /etc/grub.d and settings from /etc/default/grub

### BEGIN /etc/grub.d/00_header ###
...
### END /etc/grub.d/00_header ###

### BEGIN /etc/grub.d/10_linux ###
menuentry 'Ubuntu, con Linux 2.6.32-29-generic' --class ubuntu --class gnu-linux
--class gnu --class os {
    recordfail
    insmod ext2
    set root='(hd0,1)'
    search --no-floppy --fs-uuid --set 61eac4c6-10b0-40b5-93f2-32e8bebd3e5
    linux /boot/vmlinuz-2.6.32-29-generic root=UUID=61eac4c6-1... ro quiet splash
    initrd /boot/initrd.img-2.6.32-29-generic
}
...
```

update-grub

Init (compatible SystemV)



- `/sbin/init` le o arquivo `/etc/inittab`
 - Formato: `id:runlevels:action:process`
 - `i5:5:wait:/etc/rc 5`
- `/etc/rcN.d`
 - *N=Runlevel (5 => multiusuario con entorno gráfico)*

K08vmware	S20exim4	S50cups
K20acpi-support	S20fancontrol	S50pulseaudio
K20bluemon	S20hotkey-setup	S50rsync
K20postfix	S20kerneloops	S50saned
S01policykit	S20virtualbox-ose	S99ondemand
S10sysklogd	S20virtualbox-ose-guest-utils	S99rc.local
...		



- O “init” agora é diferente
 - Ao arrancar carga a súa configuración do directorio `/etc/init`

```
# anacron - anac(h)ronistic cron
```

```
#
```

```
# anacron executes commands at specific periods, but does not assume  
# that the machine is running continuously
```

```
description "anac(h)ronistic cron"
```

```
start on runlevel [2345]
```

```
stop on runlevel [!2345]
```

```
expect fork
```

```
normal exit 0
```

```
exec anacron -s
```

```
acpid.conf
```

```
alsa-mixer-save.conf
```

```
anacron.conf
```

```
.....
```

```
nmbd.conf
```

```
plymouth.conf
```

```
plymouth-log.conf
```

```
.....
```

Job

Systemd

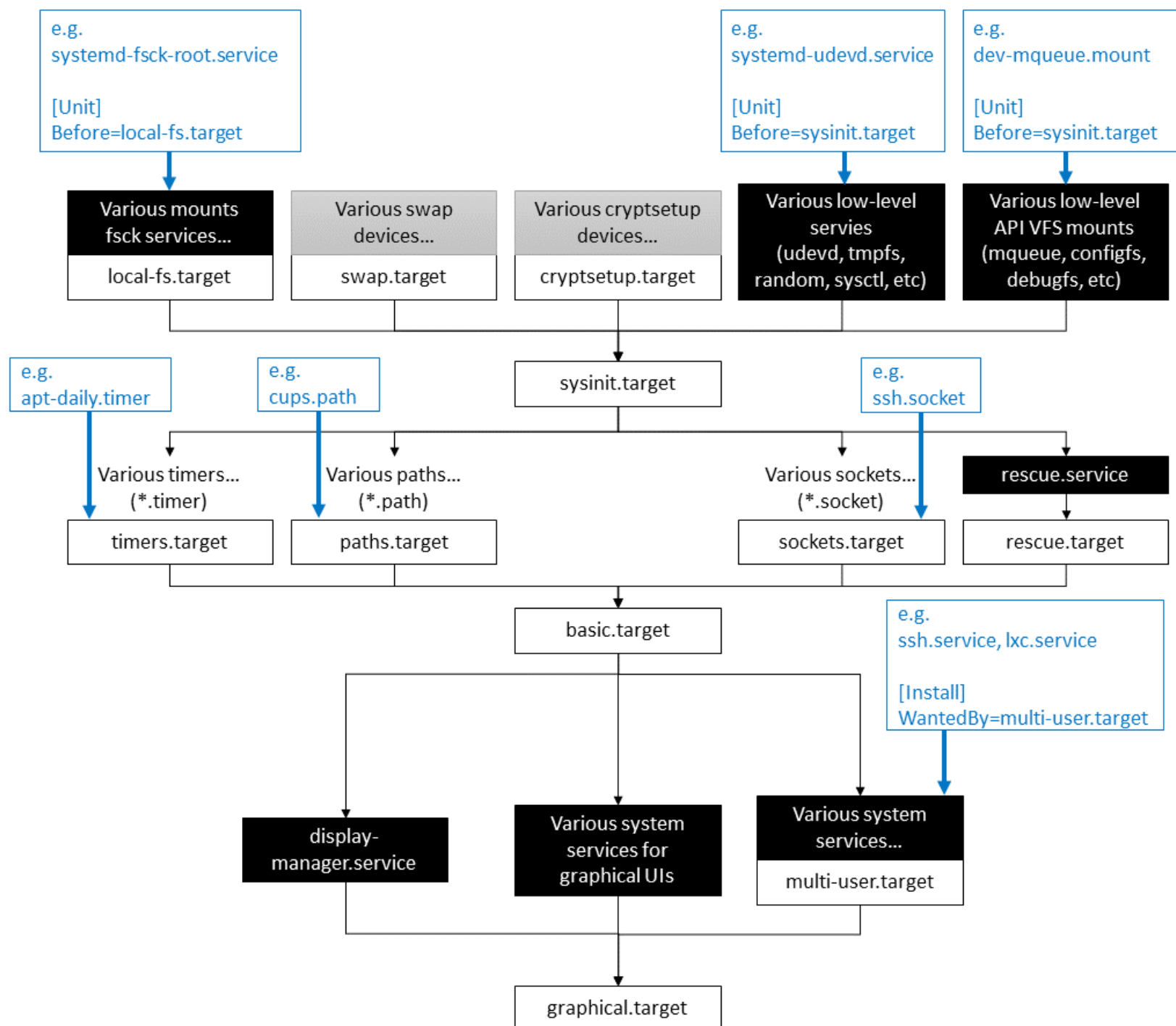


<https://opensource.com/article/17/2/linux-boot-and-startup>

- Séguese chamando */sbin/init* con PID 1
- Concepto clave: **unit** => recursos do sistema
- */etc/systemd/system* ou */lib/systemd/system/*
 - *.service* => equivalente ao job
 - *.target* => sustitue aos *runlevels*
- *default.target*

graphical.target

```
[Unit]
Description=Graphical Interface
Documentation=man:systemd.special(7)
Requires=multi-user.target
Wants=display-manager.service
Conflicts=rescue.service rescue.target
After=multi-user.target rescue.service rescue.target
AllowIsolate=yes
```





Comandos para xestionar servizos

- *systemctl [opcións] comando [opcións do comando]*
- Opcións: *-a* => amosar todas as unidades
- Comandos: *start, stop, reload, restart*
 - *isolate* => como cambiar de runlevel
 - *reboot, poweroff, hibernate, ...*
- Exemplo:
 - *systemctl -a |grep cups*
 - *systemctl stop cups.service*