20 years of CONFIG_VT

David Herrmann
<dh.herrmann@gmail.com>

According to slashdot:

My linux-kernel VTs...

...can magically recover a system without a rootfs!

…provide a shell in the kernel!

...drive serial consoles!

...have a clean code-base!

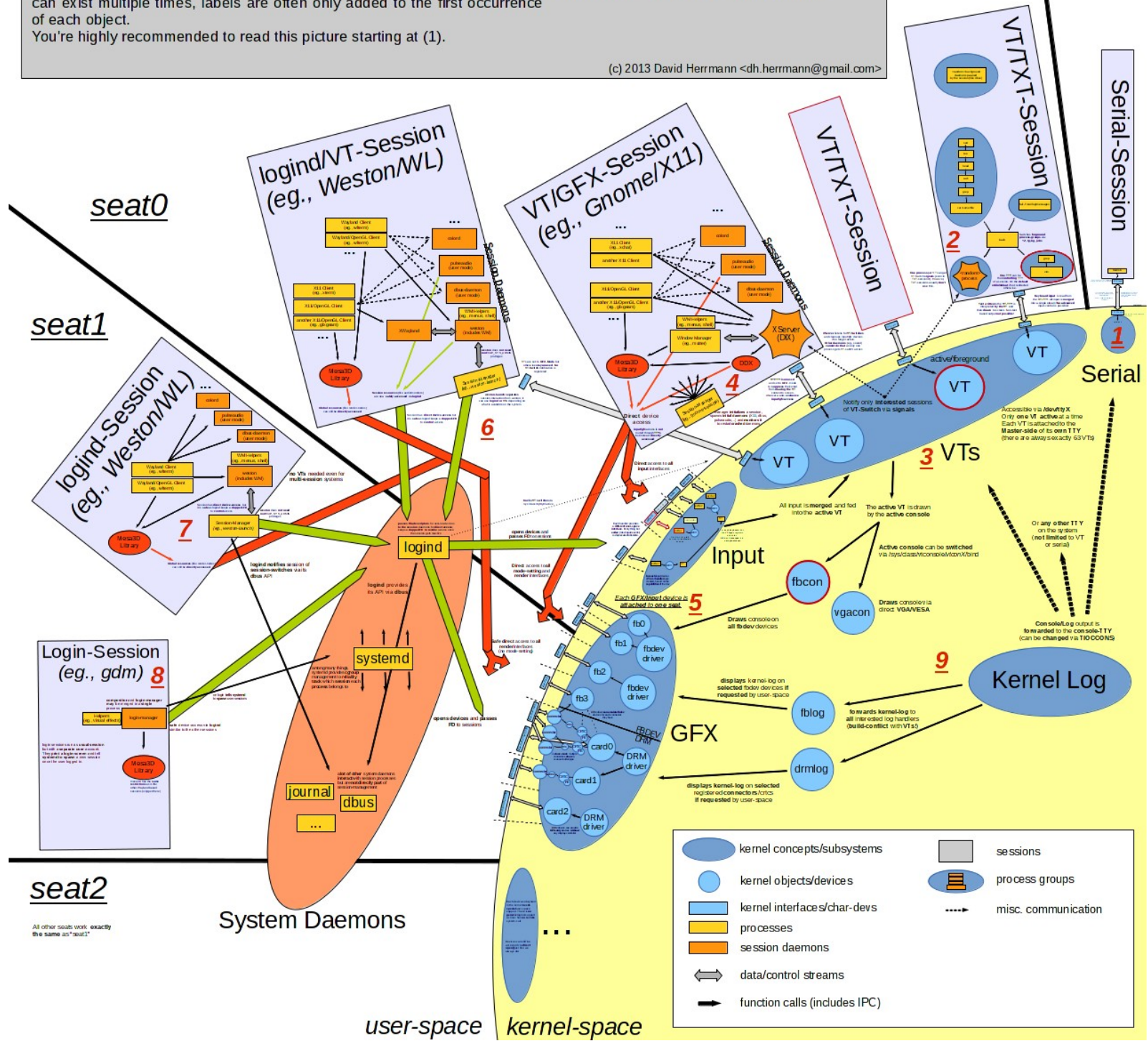...haven't had any bugs in the last century!

Linux Session-Management

This image describes the interaction between the different user-space and kernel-space subsystems related to session-management. As many objects can exist multiple times, labels are often only added to the first occurrence of each object.

You're highly recommended to read this picture starting at (1).

Some interactions between the different sessions are still experimental and uncommon on modern linux systems. Hence, this overview may only partially apply to your system.

(c) 2013 David Herrmann <dh.herrmann@gmail.com>

serial seat

Serial-Session

VT/TXT-Session

VT/TXT-Session

logind/VT-Session (eg., Weston/WL)

VT/GFX-Session (eg., Gnome/X11)

seat0

seat1

logind-Session (eg., Weston/WL)

Login-Session (eg., gdm) *8*

seat2

All other seats work exactly the same as "seat1"

System Daemons

2

3 VTs

4

5

6

7

Serial

VT

Input

fbcon

vgacon

GFX

Kernel Log *9*

fblog

drmlog

logind

systemd

journal

dbus

Legend

kernel concepts/subsystems		sessions
kernel objects/devices		process groups
kernel interfaces/char-devs		misc. communication
processes		
session daemons		
data/control streams		
function calls (includes IPC)		

user-space | **kernel-space**

linux-0.01

"Hopefully this will be a rather complete vt102 implementation"

    (drivers/tty/vt/vt.c)

Unix Session-Management

setsid() / setpgid()

"I haven't get the stomach for it. I also don't fully understand sessions/pgrp etc. Let somebody who does explain it."

linux-0.11

console beeping

linux-0.12

VTs!

linux-0.96a

X11 support:
- KDSETMODE
- KDSKBMODE

linux-0.99.1

VT_SETMODE

(and advanced beeping)

linux-1.3.38
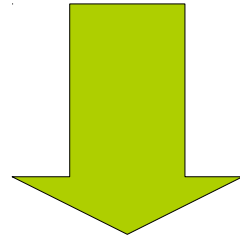
TGA-console

linux-1.3.94

fbdev support

linux-2.1.67

- fbcon
- txtcon
- vgacon
- fonts

kmscon

systemd-logind

open("/dev/<sth>", …)

logind.TakeDevice("/dev/<sth>")

Linux Session-Management

This image describes the interaction between the different user-space and kernel-space subsystems related to session-management. As many objects can exist multiple times, labels are often only added to the first occurrence of each object.

You're highly recommended to read this picture starting at (1).

Some interactions between the different sessions are still experimental and uncommon on modern linux systems. Hence, this overview may only partially apply to your system.

(c) 2013 David Herrmann <dh.herrmann@gmail.com>

serial seat

Serial-Session

VT/TXT-Session

VT/TXT-Session

logind/VT-Session (eg., Weston/WL)

VT/GFX-Session (eg., Gnome/X11)

logind-Session (eg., Weston/WL)

Login-Session (eg., gdm) _8_

seat0

seat1

seat2

All other seats work exactly the same as "seat1"

System Daemons

logind

systemd

journal   dbus

VTs   _3_   Serial

Input   _5_

fbcon   vgacon

GFX

fbog   drmlog

Kernel Log   _9_

_1_ _2_ _4_ _6_ _7_

user-space   kernel-space

Legend

kernel concepts/subsystems	sessions
kernel objects/devices	process groups
kernel interfaces/char-devs	misc. communication
processes	
session daemons	
data/control streams	
function calls (includes IPC)	