

Userspace Virtual Terminal in 2025

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Kernel VT and fbcon

VT:

- ▶ Devices: `/dev/ttyX`
- ▶ Each VT is either text-based (fbcon) or graphical
- ▶ Switch between VTs with `Ctrl+Fx`

fbcon – Kernel Terminal Emulator:

- ▶ Default console terminal
- ▶ Displays early boot logs
- ▶ Shows kernel panics

Kernel VT and fbcon – Shortcomings

- ▶ Relies on deprecated fbdev interface – DRM drivers must emulate it
- ▶ Scrolling removed due to CVE
- ▶ Limited Unicode support
- ▶ Keyboard layout and input (mouse/trackpad) limitations
- ▶ No support for multi-seat setups

Kmscon

Started in 2014 – maintained at <https://github.com/Aetf/kmscon>

- ▶ Lightweight and plugin-configurable:
 - ▶ **Video:** fbdev, drm2d, drm3d
 - ▶ **Font:** built-in, unifont, pango
 - ▶ **Renderer:** bbulk, pixman, gltex
- ▶ Supports VT and non-VT sessions, including multi-seat
- ▶ Uses `xkbcommon` for input
- ▶ No mouse support yet
- ▶ Now in Fedora Rawhide

Userspace VT

A set of systemd scripts to launch a Wayland compositor with a fullscreen terminal as the only client.

Project: <https://gitlab.com/kdj0c/userspacevt>

Fedora COPR:

<https://copr.fedorainfracloud.org/coprs/jfalempa/Userspacevt/>

Compositor / Terminal combinations:

- ▶ Cage / Foot
- ▶ GNOME Kiosk / Ptyxis
- ▶ KWin / Konsole

DRM Log

A kernel driver to display early boot logs before userspace starts.

- ▶ Available since Linux v6.14
- ▶ Uses the NBCON interface
- ▶ Uses DRM client interface
- ▶ Rolling log (no scrolling)
- ▶ Can be built with fbcon, but only one can be active at boot
- ▶ **Watch demo video**

Enabling Userspace VT

Most components are ready – but we must avoid disrupting existing user workflows.

Proposed migration steps:

1. Enable DRM Panic.
2. Ensure userspace consoles are installable from default repositories
3. Enable userspace console by default
4. Enable DRM log at boot
5. Stop building fbcon and fbdev emulation in the kernel
6. Switch to `CONFIG_VT=n`

Areas of Concern

- ▶ Rescue shell in the initramfs.
- ▶ Disk encryption password fallback.
- ▶ `startx`
 - ▶ Workaround via `openvt`
 - ▶ Systemd service
 - ▶ `Kmscon kms-launch-gui.sh`

Thank you

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