

# The Struggle is Real: Linux on NVIDIA

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# The Core Struggles

## **Closed-Source Drivers**

- NVIDIA's drivers are proprietary
- Causes breakage after kernel updates and limits community fixes.

## **Weak Kernel Integration**

- Drivers run outside the kernel ecosystem.
- Leads to issues with power management, Wayland, and hybrid GPU setups.
- Linux depends on NVIDIA's slow update cycle.

# Why AMD and Intel Work Better with Linux

## **Open-Source Drivers**

- Both AMD and Intel contribute their GPU drivers directly to the Linux kernel.
- Drivers are built-in and update automatically with the system.
- Community supported.

## **Seamless Integration**

- Fully compatible with compensators, and kernel management.
- No breakage after updates.

# How Linux Distros Make NVIDIA Work

## Open-Source NVIDIA Drivers

- **Nouveau**
  - Reverse-engineered Nvidia's proprietary Linux drivers for linux support on NVIDIA GPUs.
  - Supports basic graphics but limited performance for gaming and AI.
  - NVK: Vulkan driver for Nouveau, enhancing open-source 3D graphics.

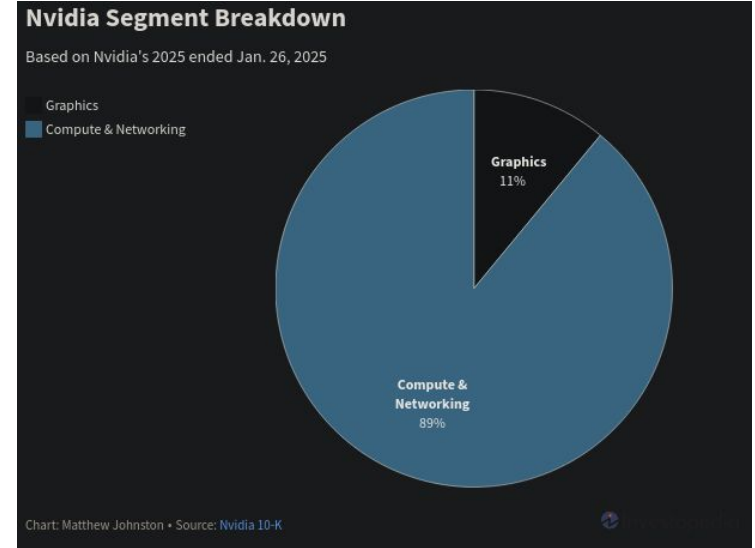
## Proprietary NVIDIA Drivers

- **Proprietary Drivers**
  - NVIDIA's closed-source drivers offer superior performance for gaming, AI, and professional workloads.
- **Distro Packaging:**
  - Developers separately package NVIDIA's proprietary drivers into distro-specific kernels.
  - Use Dynamic Kernel Module Support (DKMS) for auto-recompilation on kernel updates.
  - Some tools are integrated into the kernel to auto-detect GPUs and install drivers automatically.

# Why Nvidia Resists

As of April 2025:

- 89% of revenue comes from selling to enterprises
  - AI solutions and software (CUDA)
  - Networking
  - DGX Cloud computing services
  - Many more...
- 11% of revenue comes from selling desktop GPUs and more
- Linux community is tiny



[www.investopedia.com/how-nvidia-makes-money-4799532](https://www.investopedia.com/how-nvidia-makes-money-4799532)

# The Future

- In May 2022, NVIDIA open-sourced its Linux GPU kernel modules under a dual GPL/MIT license.
- User-space drivers still proprietary.
- Competitive pressure from Intel and AMD open model may drive change.
- Wider Linux desktop adoption could force NVIDIA to improve desktop drivers.