

Design of Device Driver

The focus of this project was to develop a graphics card driver. The driver delivers sufficient capability to the user to draw smooth-shaded triangles. Further, the driver also provides this capability in two ways:

1. Directly, through the FIFO facility using memory-mapped control registers, where the memory-mapping is invoked by a user-level system call to `mmap()`
2. Indirectly, through the DMA facility using DMA buffers, where the mapping is transparent at the user level.

For the latter, DMA completion interrupt handling was included. The initial DMA design includes a copy operation to transfer data from user space to kernel space. An improved design then avoids this copy by memory mapping kernel buffers to user space.

Language: C