1 2005/01/28 Lecture Notes

We looked at the basic architecture of a modern operating system—some hardware, a set of hardware drivers, the kernel itself, operating system libraries, user programs, and finally the user.

We also talked about the main mechanism by which the operating system maintains control—the “supervisor bit”. This bit is always set when executing kernel code, and is how the processor keeps track of what operations are allowed. User code always runs with the supervisor bit off, and the processor will not allow direct access to the hardware or certain system resources. OS kernel code, by contrast, normally runs with the bit on, and the processor allows almost everything.

The transitions between user and supervisor mode are carefully defined in the processor manual, and are the major hardware aspect of designing a secure system.