

Intro to Minix and System calls

CIIC4050

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Minix

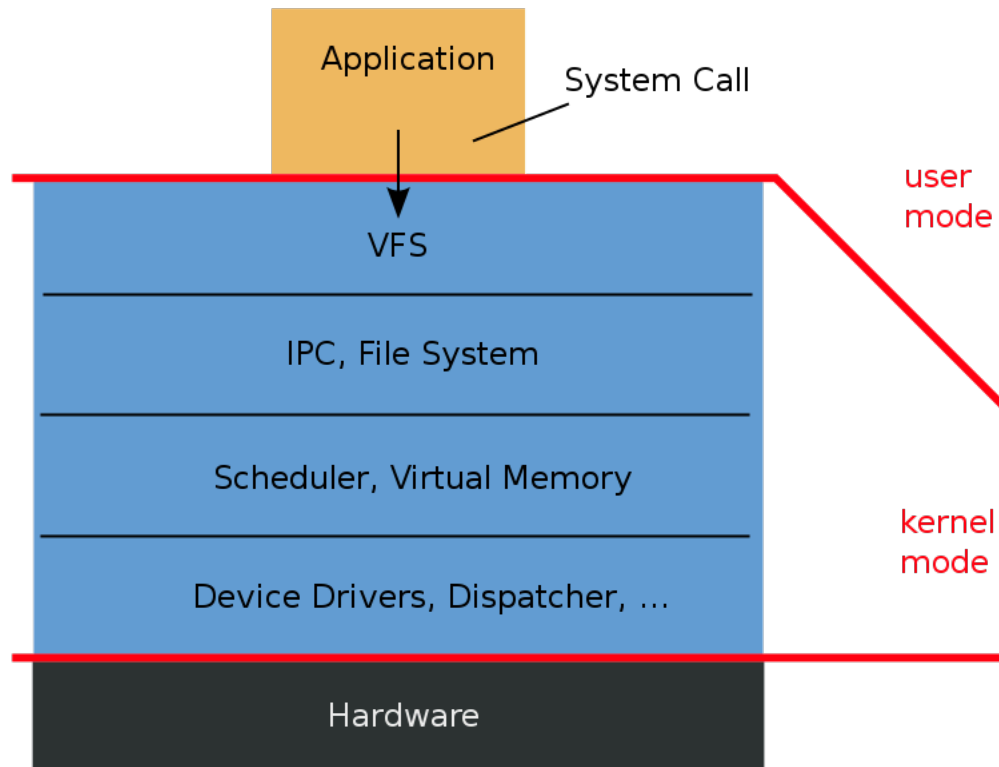
- **MINIX** (from "mini-[Unix](#)") is a [POSIX](#)-compliant [Unix-like operating system](#) based on a [microkernel architecture](#).



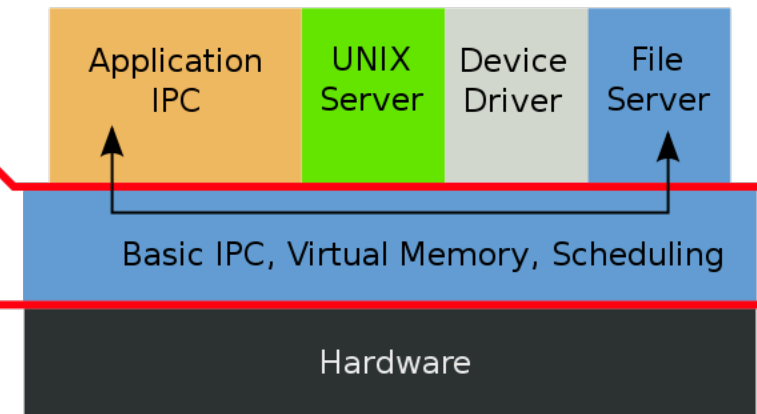
Microkernel architecture

- Is the near-minimum amount of [software](#) that can provide the mechanisms needed to implement an OS. These mechanisms include low-level [address space](#) management, [thread](#) management, and [inter-process communication](#) (IPC).

Monolithic Kernel based Operating System

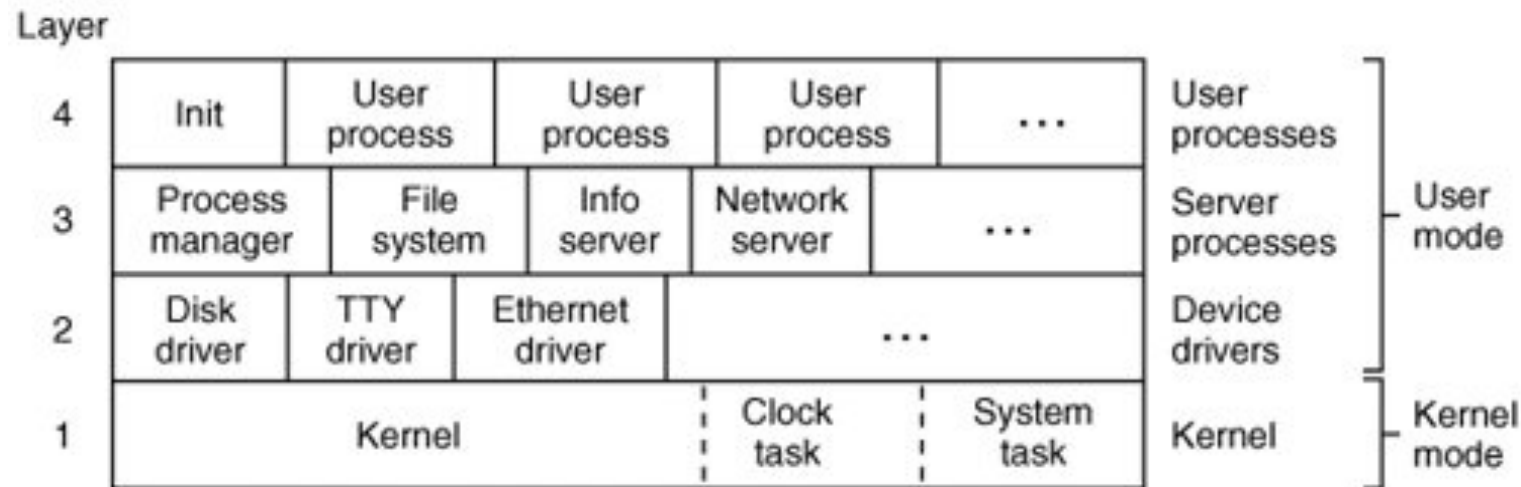


Microkernel based Operating System



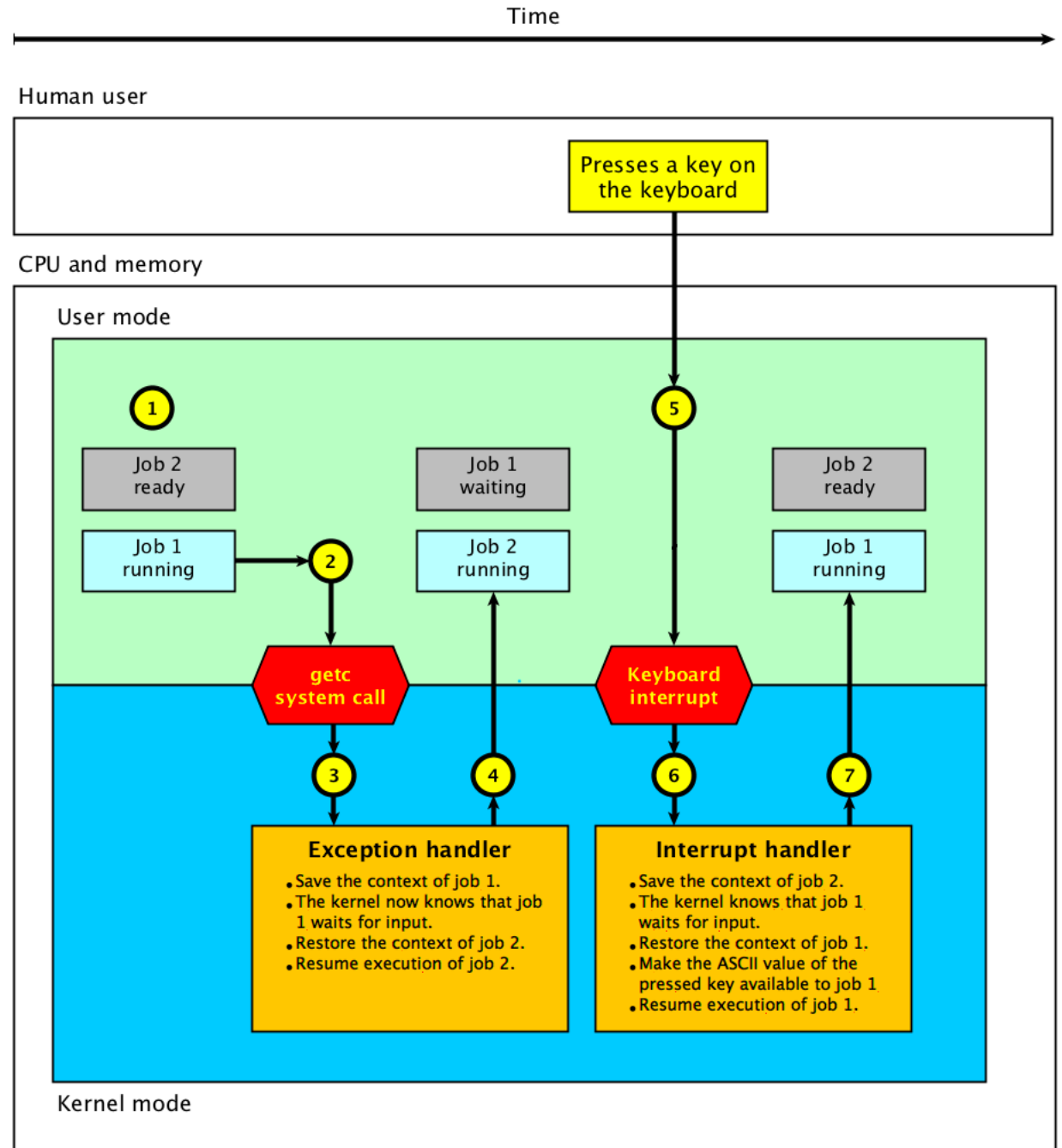
Minix

- The micro-kernel handles interrupts, provides basic mechanisms for process management, implements inter-process communication, and performs process scheduling. Filesystem, process management, networking, and other user-services are available from separate servers outside the micro-kernel.



System calls

- The system call is the fundamental interface between an application and the minix kernel.



System calls

- The system call provides an interface to the operating system services.
- Advantages:
 - Portability: as long a system supports an API, any program using that API can compile and run.
 - Ease of Use: using the API can be significantly easier then using the actual system call.

1. Minix System Call

1. in `servers/pm/proto.h` define the system call's function prototype
2. in `servers/pm/table.c` add an entry to the PM server system call table/array that maps a call number (the array position) to the system call
3. in `include/minix/callnr.h` add a call number definition for the table entry added in step 1
4. in `servers/pm` create the `misc.c` file that contains the implementation of the function defined in `proto.h`

2. Passing a parameter to a system call

- Just like any other variable, the message is allocated and has an address in the address space of the calling process.
- This address is passed to the kernel (as a result of the call to `_syscall`).
- The kernel then copies the message to the receiving process endpoint (PM in this case).

- <http://cinnabar.sosdg.org/~qiyong/qxr/minix3/source/minix/servers/pm/glo.h#L17>