ISA 563: Fundamentals of Systems Programming
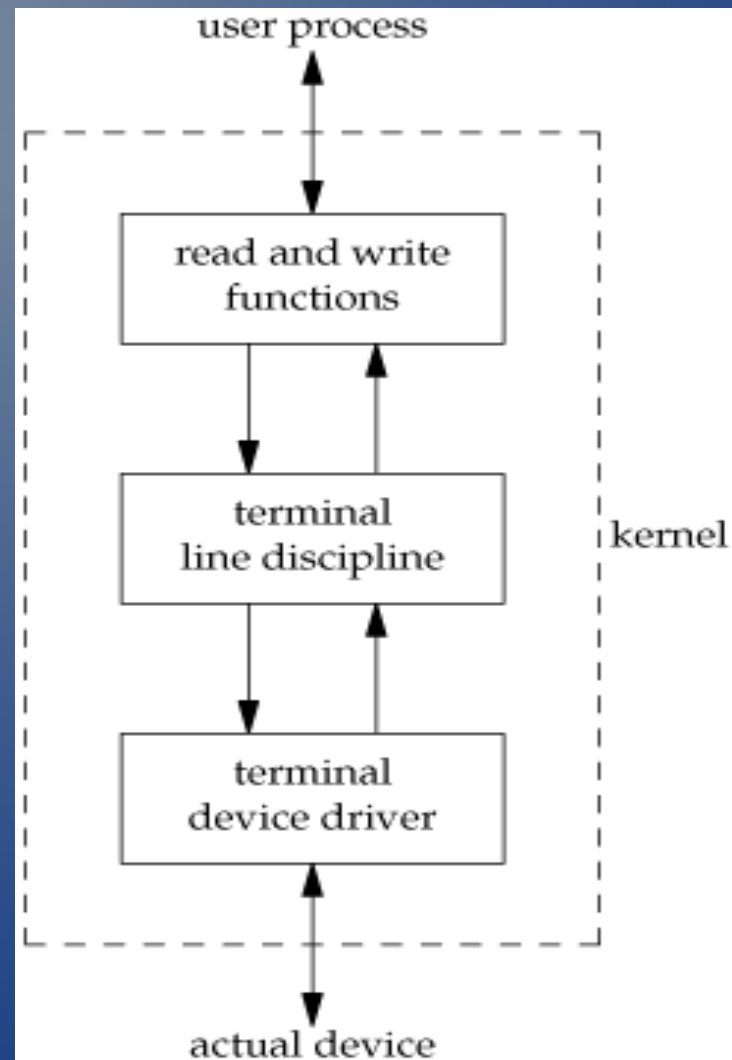
Terminal IO

April 16, 2012

Terminal IO

- Canonical mode:

    - Input is processed as lines

    - Special characters are handled by the system

    - Default mode terminal applications

- Non-canonical mode:

    - Input is not assembled as lines

    - Special characters are not handled by the system

Canonical Mode

- Impelemented by "terminal line discipline":

(Image courtesy of APUE)

Terminal Attributes

- Can be accessed and modified by termios system calls:

```
#include <termios.h>

int tcgetattr(int filedes, struct termios *termptr);

int tcsetattr(int filedes, int opt, const struct termios *termptr);
```

Demo

termbits.c

Demo

termmode.c

Demo

winch.c

Programming with ncurses

- ncurses is a library for text user interfaces:

    - terminal-independent

    - optimizes screen changes:

        – only updates parts of the screen that need to be
           updated

        – reduce latency, especially for remote shells

    - may use:

        – terminfo (majority)

        – termcap (minority)

        – both terminfo and termcap (exception)

Common Functions

- initscr()
- raw()/cbreak()
- echo() / noecho()
- printw()
- refresh()
- getch()
- getyx(scr, y, x)
- move(y,x)
- endwin()

Demo

nc_hello.c

Demo

fancy_hello.c

Demo

nc_time.c

ncurses: More Functionalities

- Menus

- Forms

- Panels

- ...