

Operating System

- Service provider to "users"

 - execute (run) programs (Thread control)

 - Input/Output

 - local machine (serial, USB, disk, ...)

 - network (eg. ether/wifi and network stack)

 - Memory Management

 - File Management

- May not provide User Interface

 - X Windows - not part of OS

 - Mac OS X user interface not part of the OS

 - shell - not part of OS

 - interactive -- run commands

 - shell scripts

 - many UNIX commands for scripts

 - built-in vs programs

 - Win 32 -- originally not in OS

 - later moved into OS for speed

System Calls vs. Library Calls

□ System Call

- Programmed request to Operating system
- API looks like C or some language
 - write (fd, mystring, nbytes)
 - fork ()
 - NtCreateFile(...), NtReadFile(...) (Windows)

□ Library Call

- A utility "user land" function / no OS computation
 - atoi (char *)
 - qsort(base, nmemb, size, compare)
 - sqrt(value) (libm, -lm to link)
- Some library functions use systems call to do job
 - printf ("%s", mystring);
 - newwin(lines,cold,begin_y,begin_x) (libcurses, -lcurses)
 - ant.c

Manual pages

- man section 1 -- User Commands

- man ls

- man intro

- man man

- man write

- man printf

- man sh

- man csh

- man mkdir

- man cp

- man rm

- man vi

Manual pages (page 2)

man section 2 -- OS calls

man 2 open

man 2 intro

man 2 write

man 2 chdir

man section 3 -- Library calls

man 3 fopen

man 3 intro

man 3 printf

man 3 getenv

An example shell -- microshell.c

Library Calls

- fprintf(3) - C stdio
- fgets(3) - C stdio
- feof(3) - C stdio
- perror(3) - C stdio
- strlen(3) - String library

System Calls

- fork(2) - Duplicate the process
- wait(2) - Wait for a process to exit

Library wrappers for system calls

- execlp(3) - start a program

