
VIKINGS
CS 333
Intro to Operating Systems
Man Pages
PORTLAND STATE

One of the great things that Unix did was put the reference manual pages right into the system.

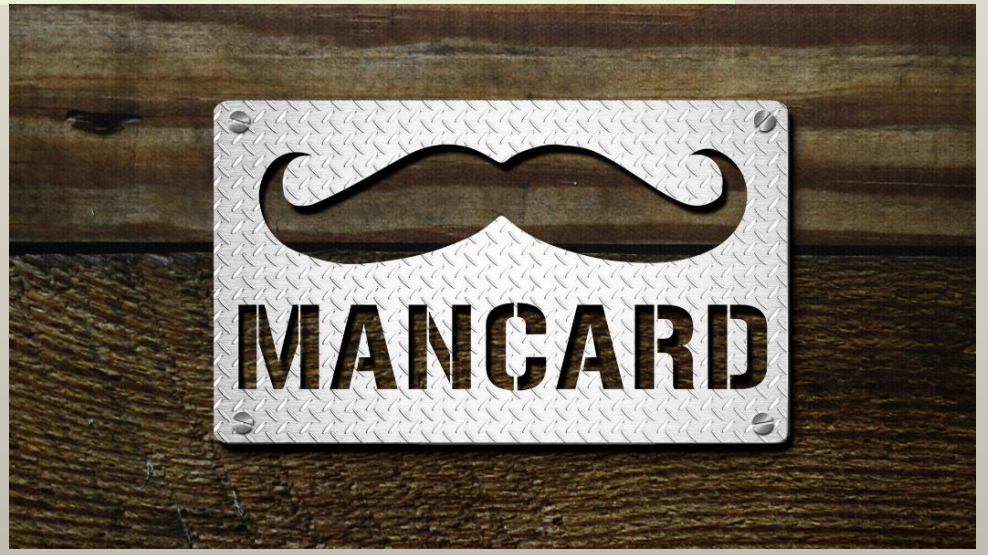
You can access all of the system commands, functions, and other information using the `man` command.

A common refrain you'll hear from me during the term will be

What does the `man` page tell you?

Or

Did you read the `man` page?



The Sections of Man Pages

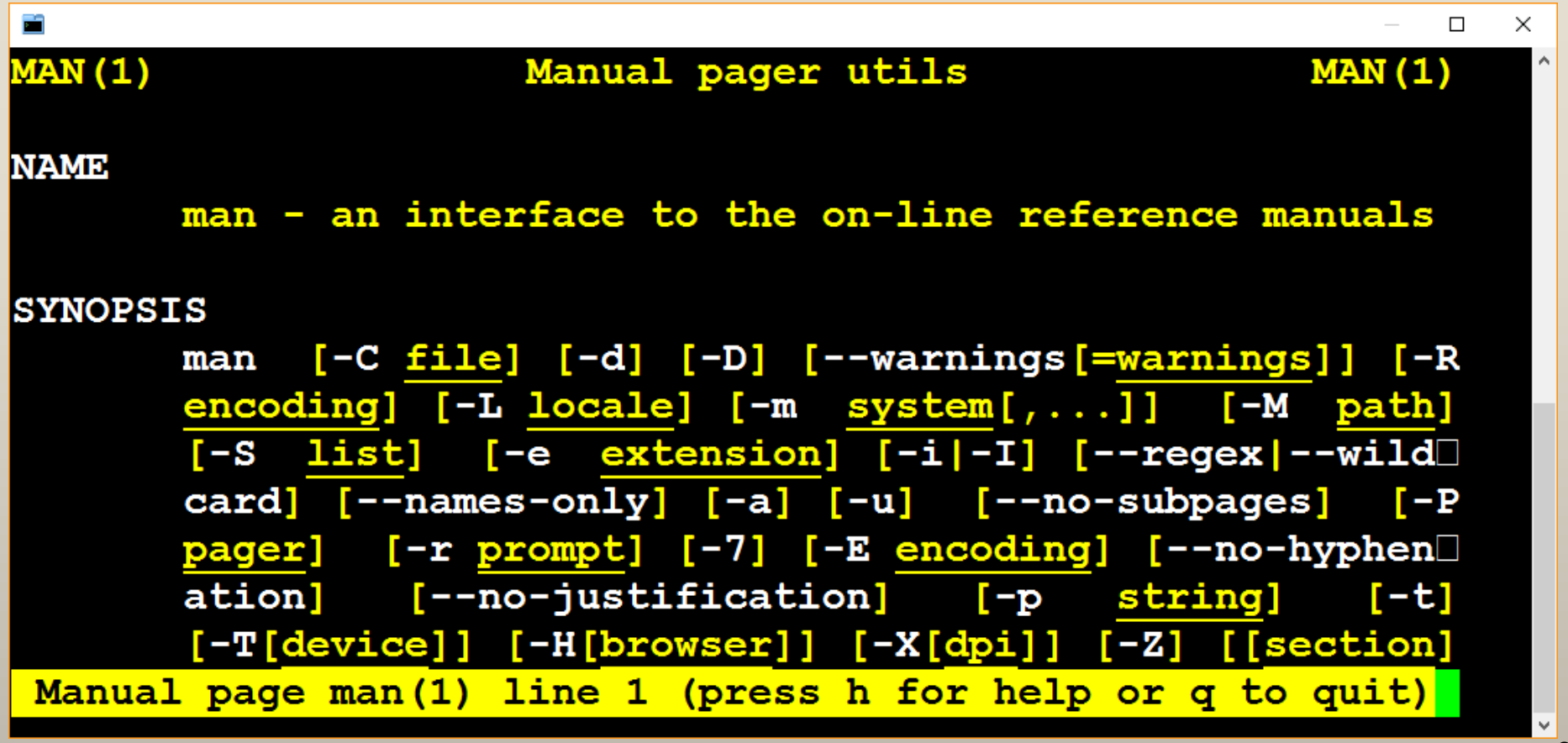
Section	Contents
1	Executable programs or shell commands.
2	System calls (functions provided by the kernel).
3	Library calls (functions within program libraries).
4	Special files (usually found in /dev).
5	File formats and conventions e.g. /etc/passwd.
6	Games.
7	Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7).
8	System administration commands (usually only for root).
9	Kernel routines [Non standard, but common for Linux].

You'll be spending most of your man time in sections 1, 2, and 3.

Man Up

One of the commands you may find yourself wanting to see the documentation for is `man`.

It is easy to do: '`man man`'



Man Pages

Sometimes finding the right `man` pages can be a little challenging.

- For example, if you type `` `man exit` `` you get the man page for the `bash` shell, which is probably not what you want.
- In this case, you probably want to issue the command `` `man 3 exit` `` or possibly `` `man 2 exit` ``
- The same goes for the `read()` and `write()` system calls. Those are in section 2 of the man pages, though you can also find some of the information for those in section 3.

Man Pages Layout

All `man` pages follow a common layout that is optimized for presentation on a simple ASCII text display, possibly without any form of highlighting or font control. Sections may include:

NAME

The name of the command or function, followed by a one-line description of what it does.

SYNOPSIS

In the case of a command, a formal description of how to run it and what command line options it takes. For program functions, a list of the parameters the function takes and which header file contains its definition.

DESCRIPTION

A textual description of the functioning of the command or function.

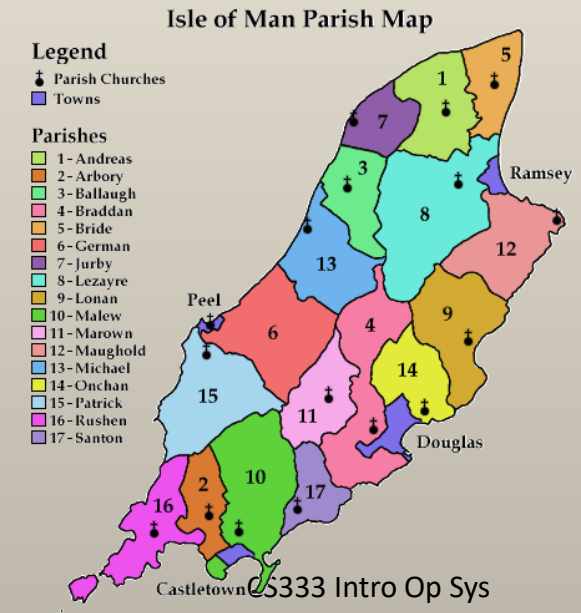
EXAMPLES

Some examples of common usage.

I like this section a lot!

SEE ALSO

A list of related commands or functions.



From section 3 in the man pages.

```
EXIT(3)                  Linux Programmer's Manual                 EXIT(3)

NAME
       exit - cause normal process termination

SYNOPSIS
       #include <stdlib.h>

       void exit(int status);

DESCRIPTION
       The  exit()  function causes normal process termina
       tion and the value of status & 0377 is  returned  to
 Manual page exit(3) line 1 (press h for help or q to quit)
```

A short description of the function.

The header file you need to include to use the function.

The function **prototype**, its return type, and the type of each of it arguments.

```
SYSCALLS(2)                Linux Programmer's Manual                SYSCALLS(2)

NAME
       syscalls - Linux system calls

SYNOPSIS
       Linux system calls.

DESCRIPTION
       The system call is the fundamental interface between an application and
       the Linux kernel.

   System calls and library wrapper functions
       System calls are generally not invoked directly, but rather via wrapper
       functions  in  glibc  (or  perhaps some other library).  For details of
       direct invocation of a system  call,  see  intro(2).  Often,  but  not
       always, the name of the wrapper function is the same as the name of the
       system call that it invokes.  For example, glibc  contains  a  function
       truncate() which invokes the underlying "truncate" system call.

       Often the glibc wrapper function is quite thin, doing little work other
       than copying arguments to the right registers before invoking the sys□
       tem  call,  and  then setting errno appropriately after the system call
       has returned.  (These  are  the  same  steps  that  are  performed  by
       syscall(2), which can be used to invoke system calls for which no wrap□
       per function is provided.)  Note: system calls indicate  a  failure  by
       returning a negative error number to the caller; when this happens, the
       wrapper function negates the returned error number (to  make  it  posi□
 Manual page syscalls(2) line 1 (press h for help or q to quit)
```

The man page for syscalls

Finding the Right Man

Man has a way to help you find what you are looking for in the man pages. You can either

```
man -k <string>
apropose <string>
```

```
man -k printf
```

Search the short descriptions and manual page names for the keyword `printf` as regular expression. Print out any matches. Equivalent to

```
apropos -r printf
```

The flag of the Isle of Man

```
jesse.chaney@loki 03:38 PM $ man -k printf
asprintf (3)             - print to allocated string
ber_printf (3)           - OpenLDAP LBER simplified Basic Enco...
bprintf (9)              - Parse a format string and place arg...
bstr_printf (9)          - Format a string from binary argumen...
curl_mprintf (3)         - formatted output conversion
devm_kasprintf (9)       - Allocate resource managed space and...
devm_kvasprintf (9)      - Allocate resource managed space and...
dprintf (3)              - print to a file descriptor
format (n)               - Format a string in the style of spr...
fprintf (3)              - formatted output conversion
fprintf (3p)             - print formatted output
fwprintf (3)             - formatted wide-character output con...
fwprintf (3p)            - print formatted wide-character output
```

Man Commands

- From within a man page, **you can search** for text by first typing the backslash character (‘/’), the text for which you are searching, and pressing Enter. You can use ‘?’ to search backwards.
- You can repeat the search by pressing the ‘n’ key. ‘N’ will search backwards.
- You can scroll up and down using the arrow keys.
- You can page down by using the space-bar or page-down keys.
- The page-up key will scroll up one page.
- You can return to the top of the mane page with the ‘g’ key.
- You can go to the end of the man page with a ‘G’ key.
- The ‘q’ key will exit the man page.

Web Man

- There are a **LOT** of web sites that contain UNIX man pages.
- I encourage you to use the man pages on **`ada.cs.pdx.edu`** (aka `linux.cs.pdx.edu`) when you are working on your programs for this class.
- Many of the other man pages are for other flavors of UNIX or Linux or may actually be out of date (or be for a Mac).
- I hate to see students wasting time looking at out of date man pages **or man pages for a Mac**.
- **One VERY good place for man pages is:**

  https://www.kernel.org/doc/man-pages/