Introduction to Linux

Presented by:

Abdulmajed Dakkak

Jason Bechtel

Toledo Area Linux Users Group (www.talug.org)

ACM UT Chapter

Agenda

- What is Unix and Linux?
- Some history about Unix and Linux
- What is GNU and the GPL?
- What is Linux used for and why use it?
- Linux FAQ
- The command line...

What is Unix and Linux?

- Unix was written by 1969
- Unix has evolved, creating variants such as Solaris, *BSD, OSX, Linux etc...
- Linux is one variant
- Linux was written by Linus Trovalds - an undergraduate student in 1991

What is Free Software/GNU?

- Stands for GNU is Not Unix
- GNU emphasizes software freedom rather than price
- GNU was founded by Richard Stallman in 1984

What is the GPL?

- (GNU) General Public License
- A legal binding license that enables developers to:
  - Write software that is guaranteed to be free (as in freedom) by requiring software developers to publish source code
  - Incorporate any GPL code in your program provided that your code is licensed under the GPL

Linux Distributions

- Linux is the kernel
- Different people package the software surrounding the kernel differently, which leads to distributions
- Different distributions appeal to different types of people. Some are for advanced users and some are for beginners.
- Analogous to programming languages

Who Uses Linux?

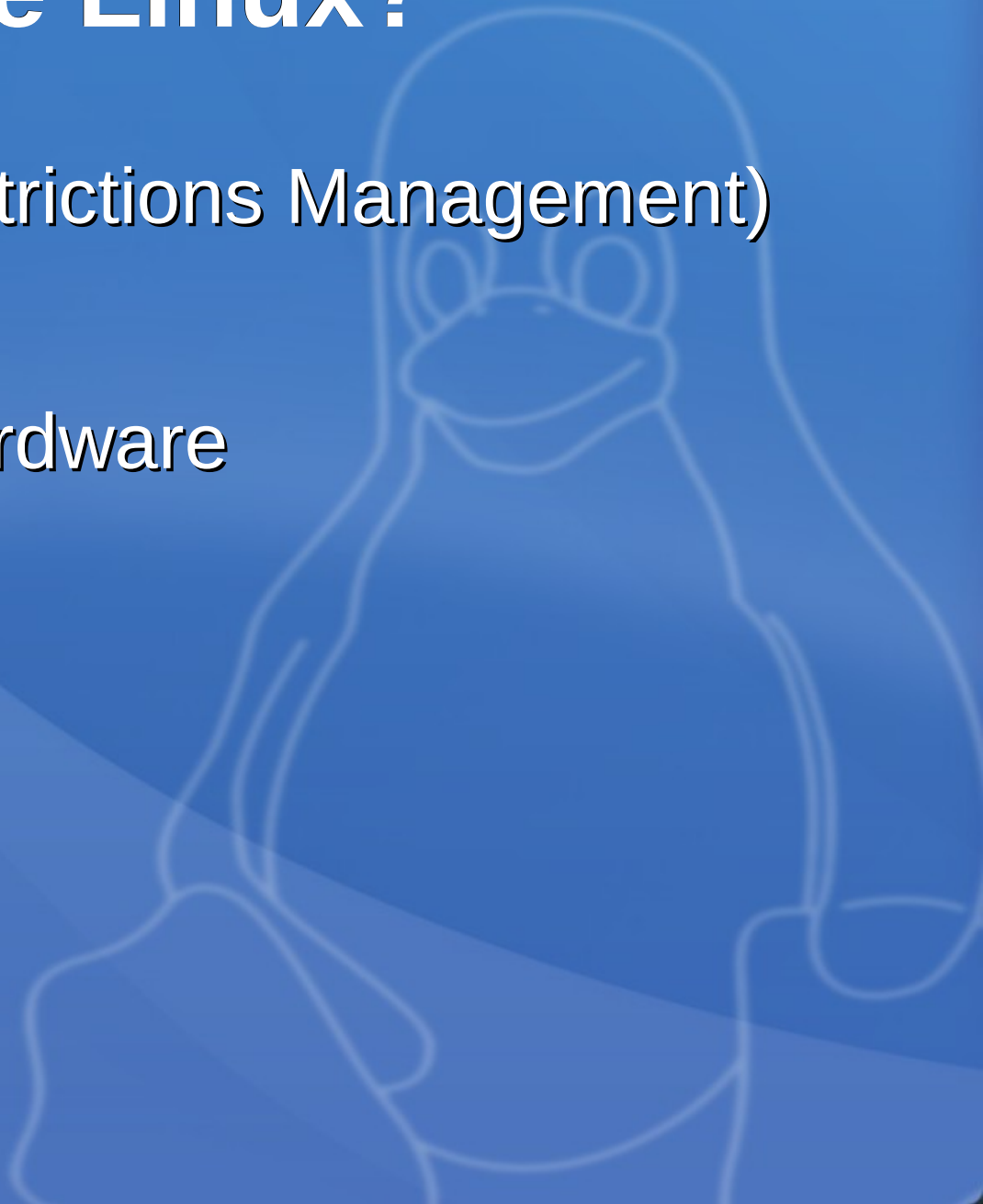
- Governments
- NASA on the Mars rovers
- Websites – Google/Amazon/eBay/...
- Probably you – TiVO, some (router|cell phone|PDA)s run Linux
- Hollywood – Lord of the Rings/Madagascar/Last Samurai/Finding Nemo/The Incredibles/...

What Can Linux be Used ON?

- x86 (Pentium), AMD64, PPC, Sparc, ...
- XboX, PlayStation2, Game Cube, ...
- iPods
- PDAs
- mainframes (S/390, etc.)
- embedded systems
- ...

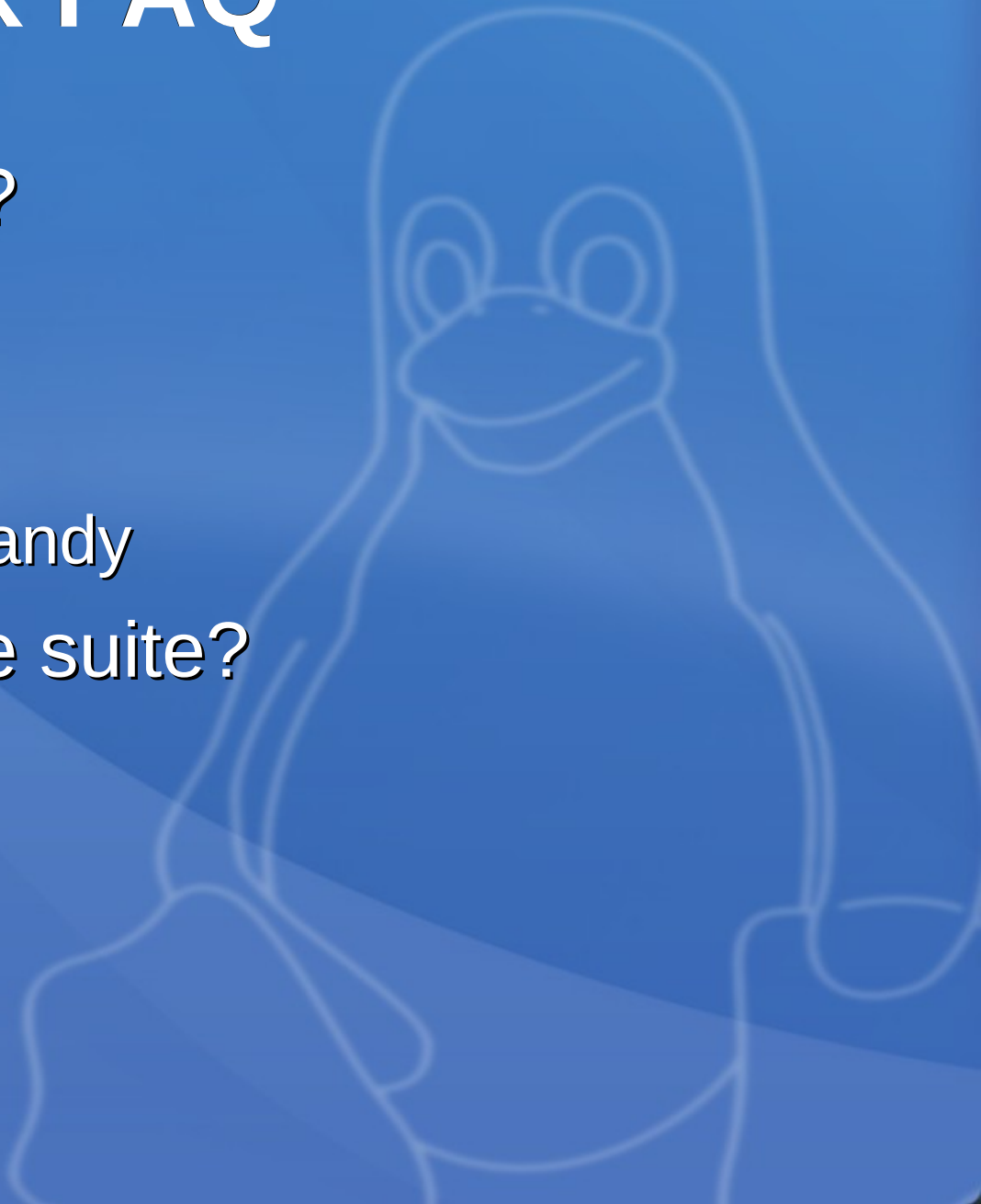
Why Use Linux?

- No DRM (Digital Restrictions Management)
- Bleeding edge
- Works well on old hardware
- Freedom



Linux FAQ

- Is it Free (as in cost)?
  - 99.9% YES.
- Does it have a GUI?
  - Yes and lots of eye candy
- Does it have an office suite?
  - Yes, a few of them

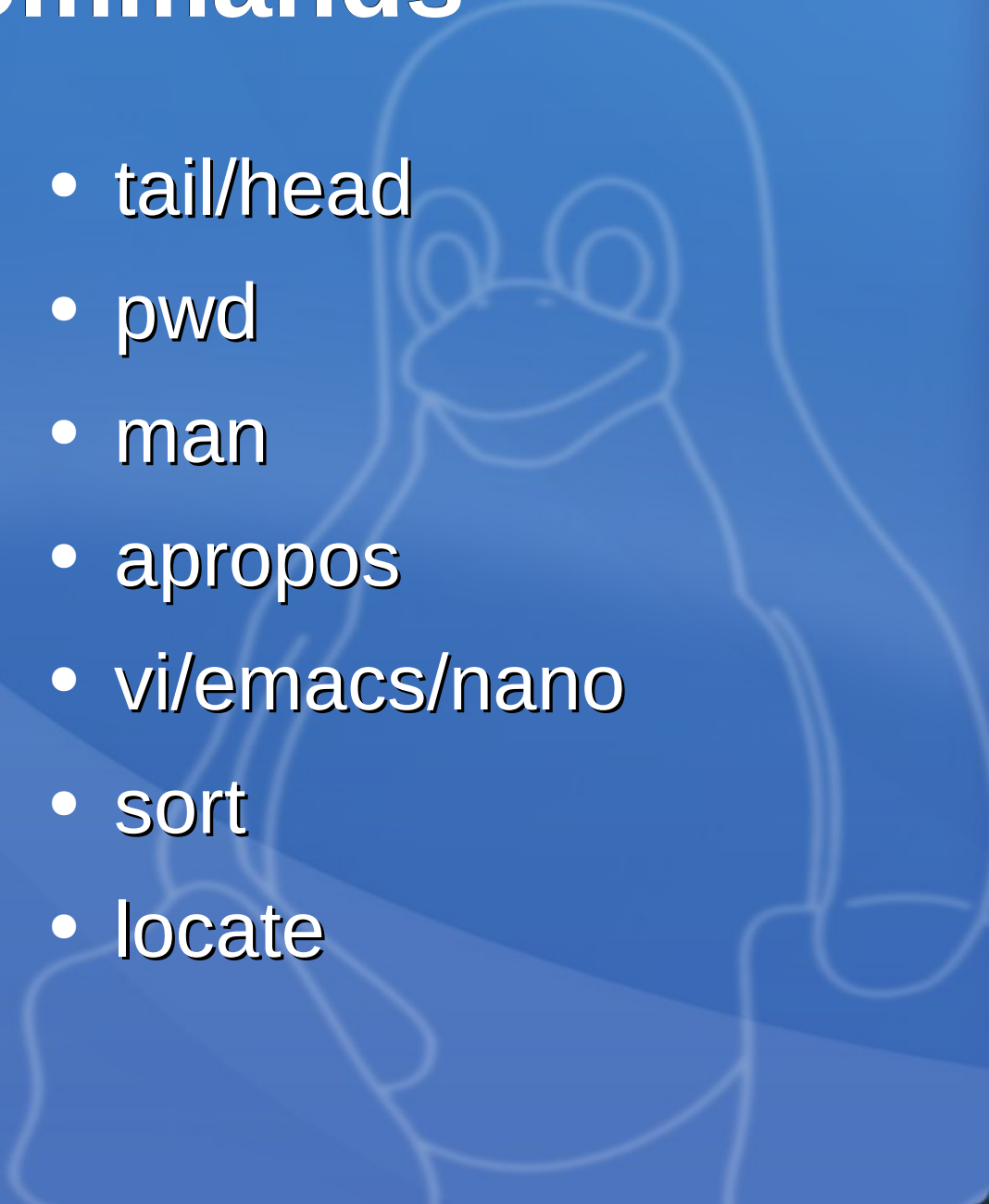


The Command Line

- Linux has a GUI, but the CLI (command-line interface) is sometimes easier
- ex. moving all files that end with d.txt to another directory
  - hard to do in GUI
  - CLI: `mv *d.txt dir/`
- CLI commands have switches/options to extend the command
- Bash is the default shell in GNU systems

Basic Commands

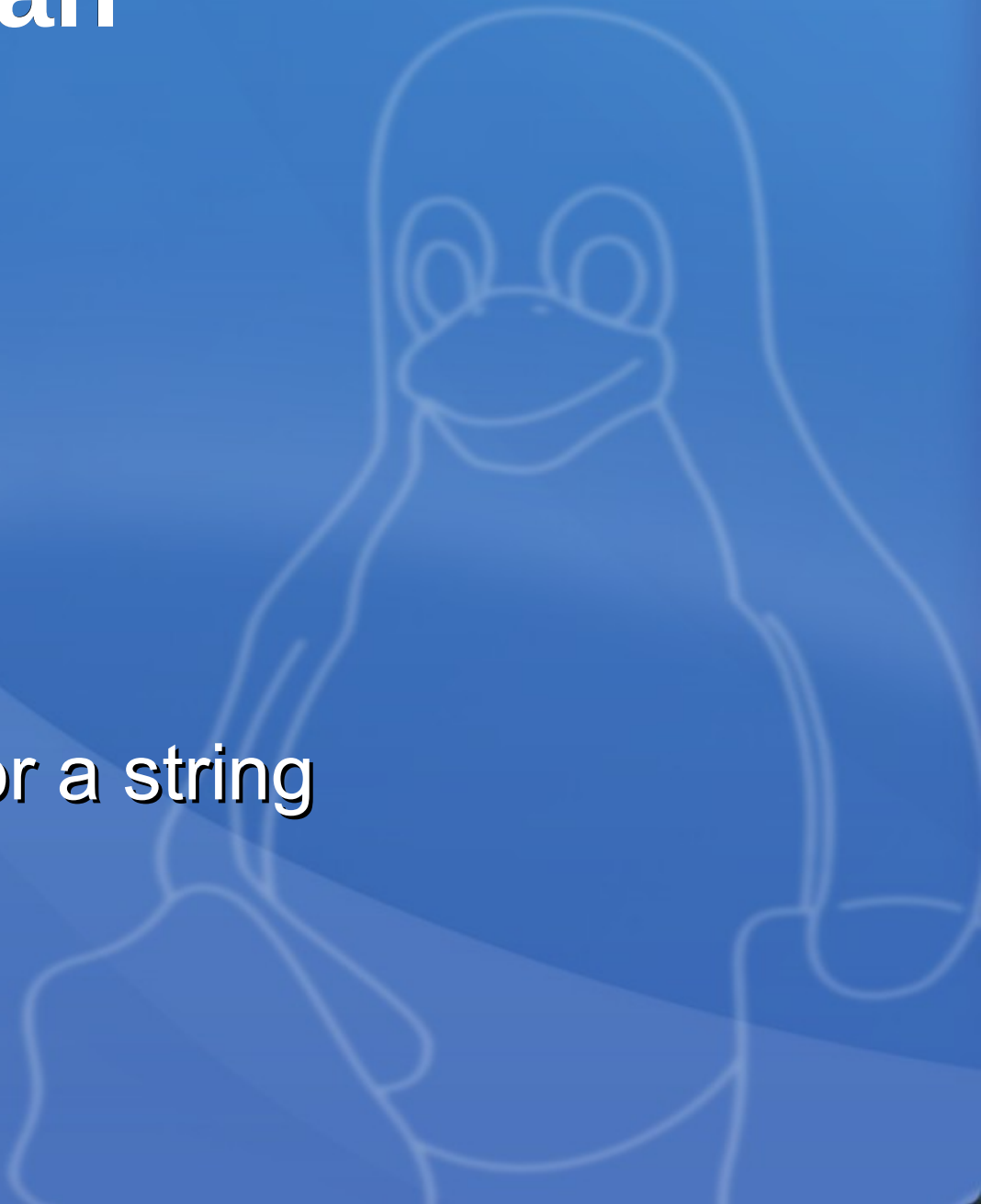
- ls
- mv
- rm
- cd
- mkdir
- less/more
- cat
- tail/head
- pwd
- man
- apropos
- vi/emacs/nano
- sort
- locate



Basic Commands in depth

man

- Stands for manual
- man [command]
- ex:
  - man ls
  - man man
- /string → to search for a string
- q → exit



apropos

- Search the manual page names and descriptions
- apropos [keyword]
- equivalent to **`man -k [keyword]`**
- ex:
  - apropos extract
  - apropos manual

ls

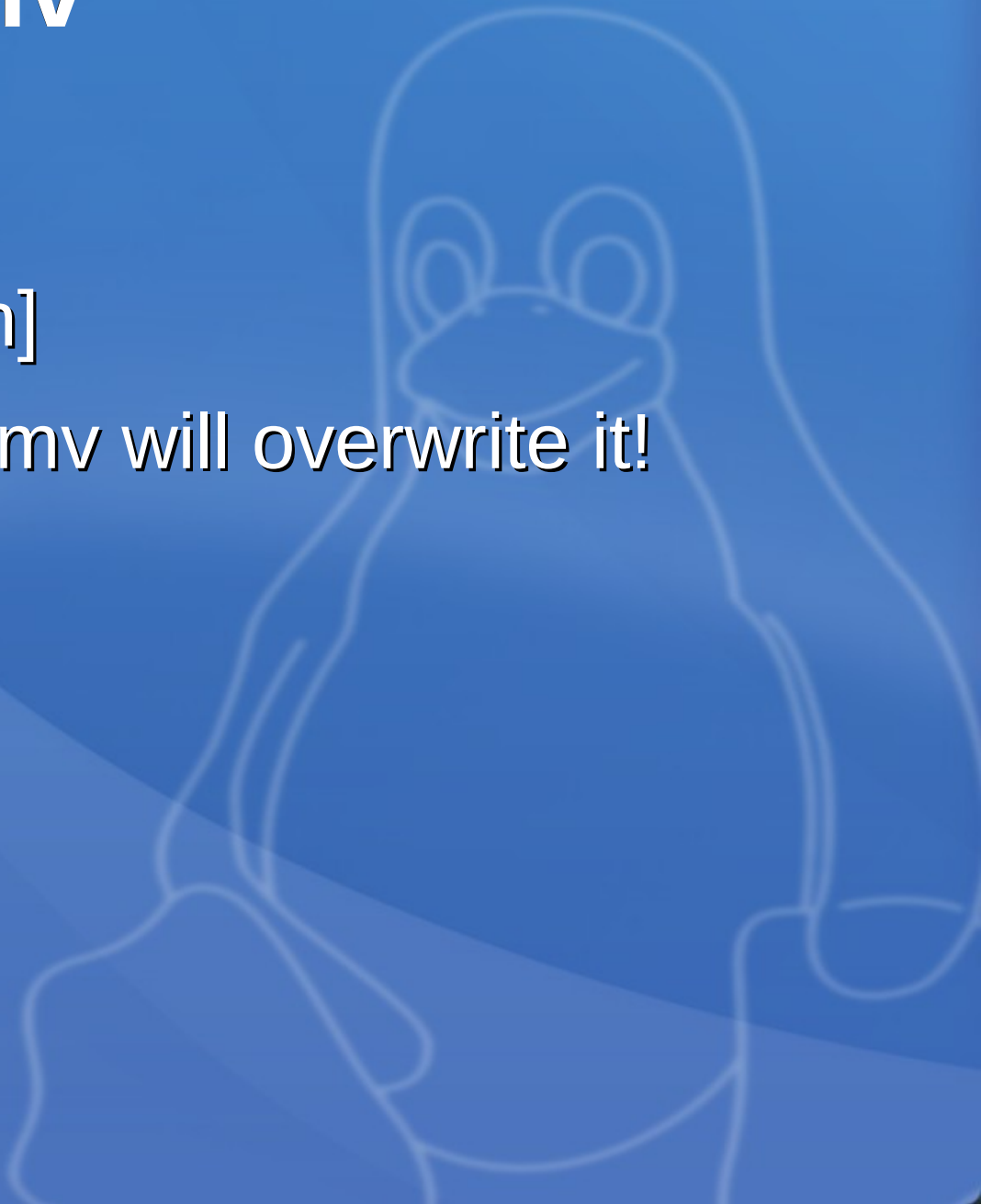
- List, called dir in DOS
- ls -l → long listing
- ls -a → show files starting with a . (dot)
- ls -t → sort listing by date
- ls -S → sort listing by size
- ls -r → reverse the sort
- ls -rSlh → reverse the listing which is sorted by size, and make the size human readable

cd

- Change directory
- cd [newDir]
- cd → goes to your home directory
- cd ~ → goes to your home directory
- cd ~john → goes to john's home directory
- cd - → goes to the previous directory
- ex:
  - cd /etc/ → go to /etc/
  - cd - → go to where you were before /etc/

mv

- move or rename
- mv [file] [newLocation]
- If newLocation exits, mv will overwrite it!



rm

- remove files or directory
- CAUTION: This will not move things to a recycle bin!
- rm [file] , or rm -r [directory]
- rm -fr [any] → force remove recursively
- rm -i file → remove interactively (ask)
- ex:
  - touch newFile → creates a file called newFile
  - rm newFile → removes newFile

mkdir

- Creates a directory
- mkdir [dirName] → creates dirName
- mkdir -p /path/to/[dirName] → creates dirName even if /path/to/ does not exist
- ex:
  - mdkir this/is/just/a/test → will complain
  - mkdir -p this/is/just/a/test
  - rm -r this → to clean things up

cat

- Concatenate files and print on the standard output
- cat [file]
- ex:
  - cat /etc/X11/xorg.conf
  - cat file1 file2 > combinedFile

less/more

- Takes input and views it a page at a time
- less [file] or more [file]
- q → quit
- ex:
  - less /etc/X11/xorg.conf
  - more /etc/X11/xorg.conf

tail/head

- View the tail or head of a file
- tail [file] or head [file]
- -[n] → the number of lines to view
- ex:
  - tail -13 /etc/X11/xorg.conf
  - head /etc/X11/xorg.conf
  - dmesg | tail
  - ls -ltr | tail -20

pwd

- Displays the Present Working Directory
- pwd
- ex:
  - pwd → shows you were you are
  - cd /etc/ ; pwd → show you /etc/
  - cd - → return to where you were

vi(m)/emacs/nano

- command-line text editors
- vi is everywhere (ubiquitous)
  - modal interface
  - vim (VI iMproved) has many advanced features
- emacs is very powerful and widespread
  - a world unto itself
- nano is like Notepad, just a basic text editor

sort

- Sort lines of a text file
- sort [file]
- sort -r → reverse the sort
- sort -u → show only unique entries
- ex:
  - sort fileContainingListOfThings
  - cat listFile | sort -un
  - cat listFile | sort | uniq -c

locate

- Basic command to find files
- locate [keyword]
- uses a database that must be updated periodically
- ex:
  - locate xorg.conf
- try 'man find' if locate doesn't work for you

Other Basic CLI Tools

- clear → clears the screen (also Ctrl-L)
- cal → calendar (cal 2 1889)
- bc → programmable calculator
- date → prints date
- uname → prints system info (uname -a)
- gcc → GNU compiler collection
- alias → shell built-in; manage commands
- echo → print stuff to stdout
- wc → word count

Questions?

- http://talug.org
  - events
  - documentation
  - distributions, software, etc.
- http://distrowatch.com
- http://freshmeat.net
- http://lwn.net