LUG Newbie Week

09/06/16

Linux Users Group

For individuals interested in
Linux, Unix, and their byproducts.
We are also in the ACM office (SEL 2264).

Resources:

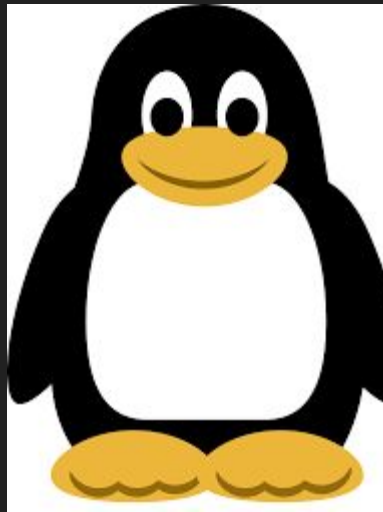
- 3D Printing (10 cents/gram)
- Arduino
- Raspberry Pi
- Test Servers
- Tiled Displays
- Linux Machines

Sign up for our listserv at! E-mail listserv@uic.edu with the body “SUBSCRIBE LUG”

Officer E-mail: lug-uic-officers@googlegroups.com

Upcoming Events

- Newbie Week
  - 9/6, 9/7, 9/9, 9/12, 9/13 5-6 PM
  - SEL 2254
- Install Fest
  - 9/14 5-7 PM
  - SEL 2254



Welcome to NEWBIE Week

- Welcome everyone to the first Linux User's Group event of the year.
- This is mostly going to be geared towards students who want to use Linux, but do not know how.
- There will be more events during the year geared towards more advanced users of Linux as well.
- After NEWBIE week, we will be holding an event called install fest. This will give opportunities to students to install LINUX as a dualboot or however they would like. We will have many different distros to choose from.

Possible LUG Events

- Command of the Week
  - Go over a new linux command every week.
    - A bit more easygoing.
- Linux From Scratch
  - Create a linux kernel from scratch.
    - Exciting, but be prepared to be challenged.
- Debugging Competition
  - Debug common linux problems. There will be varying levels of difficulty.

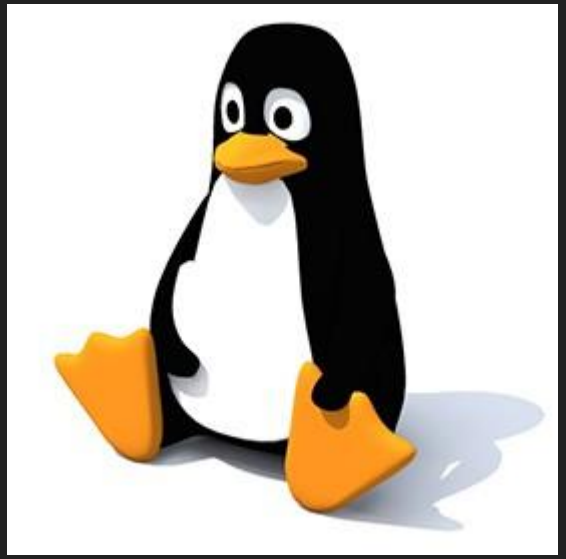
LUG Install Fest

- Held September 14th from 5 - 7 PM
  - We will help you install linux on your personal machines!
    - There will be a wide variety of linux distros to choose from.
      - Mint
      - Arch
      - Ubuntu
      - Fedora (Does not boot UEFI)
      - CentOS
      - OpenSUSE
      - Debian

Download the Slides

http://bit.ly/2cqEsYY

What is Linux?



- Linus Torvalds
  - Released the Linux kernel in October 5, 1991
- Leading operating system on servers.
- Great platform for programmers.
  - PROS
    - Very useful tools.
    - Offers more control over computer than other OS.
  - CONS
    - Harder learning curve.
- Today we will be going over tools and basics of CentOS, but really, these tools are available on almost if not all linux distros.

Terminal

- You should be using this all the time for classes.
- Let’s make a shortcut to access the terminal.
- Settings->Keyboard->Shortcuts->Custom Shortcuts->Click +
  - Name it “Terminal Shortcut”
  - Give it the command “gnome-terminal”
  - Click disabled and give your shortcut keys
  - I like to use ctrl + alt + t as my terminal shortcut.

Navigating on your terminal

- What is a terminal?
  - An interface that allows you to enter commands to interact with your computer
- How do we see files and navigate on the terminal?
  - cd
    - Stands for change directory. We can use it to navigate the file system on your computer.
  - ls
    - List directory contents. Use it to show files that are contained in directories.
- Demo time.

How do we write and compile programs?

- Typically, LINUX distros have package managers which allow us to easily install or uninstall programs from the command line.
  - We won't be able to do this on the computers in this lab because we do not have sudo (administrator privileges).
  - If you come to install fest, then you will be able to do this easily.
- Lets try writing a program using vim (a text editor) and compiling with gcc.
  - Please keep in mind that we will have another day where we describe how you can improve vim, because it can be a very powerful text editor.
- https://drive.google.com/open?id=0BwSJjZCo7CbweTMtdU1mQXdUVGM
- Demo Time

Redirection

- Allows the programmer to redirect input/output to or from a program to a text file.
  - >, redirects standard output to a text file.
  - <, redirects standard input into program
  - >>, appends standard output to an existing file or creates a new file. This does not overwrite the previous contents of that file.
- Demo Time
  - Locate the files in Redirection Example
    - There is a cpp file demo.cpp and a text file demo.txt
    - Run the following:
      - g++ demo.cpp
      - ./a.out < demo.txt

Redirection (cont.)

- There is a lot more text files. These are files from real research. How could we get these files in order all in the same file?
  - Check out the bash script createFile.sh
  - Run the bash file and see what happens
    - bash createFile.sh

Grep

- Grep is a powerful tool that will allow us to search a file for specific keywords.
- Let’s try searching output from a program for specific keywords.
- Please download the existing program at this link.
  - https://drive.google.com/open?id=0BwSJjZCo7CbwMGxwZXZhT0RTSW8
- Demo time
  - grep Error errorLog.txt
  - grep Error errorLog.txt | sort | uniq
  - How are these different? Why?

Piping

- How can we manipulate the search we issued earlier?
  - There are a lot of different lines in our output that have the same keyword. What if I only want to see one type of each line?
    - Pipe with the keyword UNIQ
  - What if we need to sort our output?
    - Pipe with the keyword SORT
  - What if we want both?
    - Pipe with both keywords UNIQUE and SORT
- Allows us to be creative with our tools! Can you think of more combinations that might be helpful?

Linux PSA Moment

- Remember that Linux has these extremely powerful tools; however, Linux will also let you make mistakes that may harm your system.
  - “With great power comes great responsibility.” - Ben Parker
- Make sure that you are always confident that you are safe before issuing a command that alters your system.

Piping Cont.

- Time for a different example. What happens if something stops responding.
- Let’s take a look at our process list. ps aux
  - ps aux (ps = processes, a = display all processes, u = show user, x = show processes not attached to terminal.
  - Manageable.. But I’m lazy. I want my computer to do my work for me.
  - My libreoffice stopped working.. How can I issue a command so I can find the problem program?

Piping Cont

- So I should pipe grep.
  - Let’s go ahead and try it
  - ps aux | grep libre
- That’s annoying.. Grep creates a process that I’m looking for libre. Can I omit this?
  - Yes you can. In grep we can omit a search result using -v and a keyword.
  - ps aux | grep libre | grep -v grep
- Well now I know what process id (pid) is running libre. In order to kill a process, we can issue a command kill.
  - kill 24986
- Let’s grep to make sure it’s gone.

Piping Cont.

- Can we do all that in the same command?
  - Yes we can.
  - awk is a data extraction tool. It searches a specific column for an item.
  - ps aux | grep libre | grep -v grep | awk ‘{print $2}’
    - Prints the PIDs of both libre processes
  - xargs allows us to accept arguments from the command line. This will give the command we issue these arguments, and they will executed in succession.
    - ps aux | grep libre | grep -v grep | awk ‘{print $2}’ | xargs kill
  - Lets make sure this worked.

Want To Learn About More Tools?

- There are tons of useful tools
  - imagemagick (resizes and converts image files)
  - apropos (searches for a command by description)
- And funny ones..
  - sl
  - hollywood (demo)
- There are tons of resources online for you guys to find great stuff.
  - This website, the man pages, is your best friend.
    - http://linux.die.net/man/
    - https://linuxjourney.com/

Thank You For Attending

- I really hope you guys like Linux as much as I do.
  - It really is a great lightweight OS for everything. (except maybe gaming)
- Questions?