# CSC 361 Lab Session 1

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# Agenda

1. Introduction to the Linux GUI interface
2. C/C++ Programming Review
3. Remote login to this lab
4. Lab environment: the router and tools

# Linux GUI interface

- Open your home folder from GUI
- Available applications in Linux
- Open a text editor from GUI
- Open a console

# Basic Linux commands

- **ls** - list directory contents
- **cd** - change directory
- **mkdir** - make directories
- **cp** - copy files and directories
- **mv** - move (rename) files
- **rm** - remove files or directories
- **man** - an interface to the reference manuals
- more commands - `http://ss64.com/bash/`
- online manpage - `http://linux.die.net/man/`

# Text editors in Linux

- **Emacs** - an extensible, customizable text editor
- **Text Editor (gedit)** - the official text editor of the GNOME desktop environment
- **vi/vim** - screen-oriented text editor
  `http://www.cs.colostate.edu/helpdocs/vi.html`

# Compile and run your C/C++ program in Linux

- **gcc** C compiler
- **g++** C++ compiler

**example:**

*gcc -o hello hello.c* or *g++ -o hello hello.cpp*

- create a new c/c++ file with your favorite text editor
- write a c/c++ helloWorld program
- compile and run your program
- debug your program with **gdb**!
  `http://www.cs.cmu.edu/~gilpin/tutorial/`

# Sample 1: main function

```
#include <stdio.h>
int main(int argc, char *argv[]){
    int i;
    for (i=0; i<argc; i++)
        printf("%s ", argv[i]);
    printf("\n");
    return 0;
}
```

# Sample 2: strings (char array)

```
#include <stdio.h>
int main(){
    char src[] = "hello world";
    char dest[256];
    int i = 0;
    for (i=0; src[i] != '\0'; i++)
        dest[i] = src[i];
    dest[i] = '\0';
    printf("String dest is: %s\n", dest);
}
```

# Sample 3: pointer and storage allocation

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int main(){
    char src[] = "hello world";
    char *pointer1 = src;
    char *pointer2 = malloc(sizeof(char) * 256);
    strcpy(pointer2, src);
    src[0]++;
    printf("String of pointer1 is: %s\n", pointer1);
    printf("String of pointer2 is: %s\n", pointer2);
    free(pointer2);
}
```

# Sample 4: parameter passing

```
#include <stdio.h>
void func(char * input){
    (*input)++;
}
int main(){
    char src[] = "hello world";
    char * pointer = src;
    func(pointer);
    printf("String src is: %s\n", src);
}
```

# Remote login to this lab

- Remote login:

**Command:**

*ssh -l<username> <host>* or *ssh <username>@<host>*

- Remote copy file:

**Command:**

*scp <user>@<from_host>:<dir> <user>@<to_host>:<dir>*

For Windows/MacOS user:

- Download SSH client software: PuTTY, PuSFTP, WinSCP.

Notice:

- Desktop names in ecs360: n-greekleetter.csc.uvic.ca, e.g., n-beta.csc.uvic.ca. (Command: hostname)
- Do not reboot/close the desktops in ecs360 unless told by the instructors.
- IT support: `https://connex.csc.uvic.ca/portal/site/itsupport`.

# Access the router

- Router interfaces
  - LAN: 192.168.1.1, port 1–4
  - WAN: 10.10.1.1, port *Internet*
- LED lights on the front panel
  - Power: ON when router is up
  - WLAN: OFF (no wireless by default)
  - Ethernet(1–4): ON when Ethernet cables are plugged
  - Internet: ON when Ethernet cable is plugged in
- Desktop interfaces
  - p2p1: 192.168.1.100
  - p3p1: 10.10.1.100
  - em1: 142.104.72.xxx

# Login the router

- Login into the router from an ecs360 desktop:

**Command**

```
ssh csc361@192.168.1.1
```

- Password: ecs360

# Show/set IP address

- *ifconfig*: display the configuration of a network interface.

**Command**

ifconfig [interface]

- Display interface configurations

**Command**

ip addr show dev <interface>

# Show/set route

- route: show routing configuration

**Command**

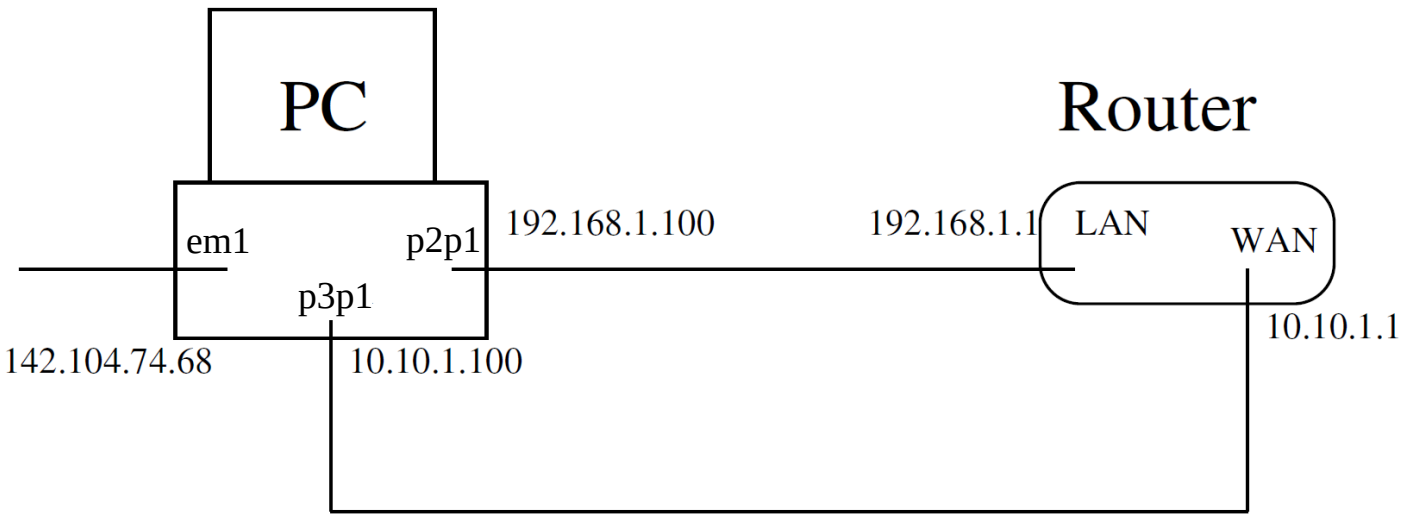
route [-n]

- Use command *ip* to display the route table

**Command**

ip route list

# How is the desktop and the router connected




*142.104.74.68 is only an example and it varies in different desktops.

# Contributors

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