

**Lecture 2.**  
**Software Development on Linux  
Platforms (Cygwin, etc.)**

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# *Outline*

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- **The Linux emulator on Windows - CYGWIN**
- **Cygwin installation etc.**
- **A GUI toolkit GTK**

# *CYGWIN – Free Software*

- **GNU + Cygnus + Windows = CYGWIN**
- **What is Cygwin?**
  - **Cygwin is a Linux-like environment for Windows.**
- **Where to get Cygwin?**
  - **<http://www.cygwin.com/>**
- **Cygwin follows GNU General Public License (GPL), meaning Cygwin is **free software**.**

# *How to Install Cygwin*

- Click “[Install Cygwin now](#)” icon on the Cygwin homepage.
- Download Cygwin binaries to a Windows directory you select.
- Follow the instructions for installation.
- Choose to “**install all**” packages if you are not familiar with how to choose the packages.
- Install Cygwin at C:\cygwin
  - Cygwin package is now very big ( > 2GB)
- The latest release is Cygwin 1.7.7 (with qt4)



# *Use Cygwin*

- **Cygwin is a complete Unix/Linux system**
  - but runs on the Windows OS.
- **So try to learn some Linux basics before you use Cygwin**
  - command line commands
  - environment setup
  - shell scripts (advanced)
- **Most important things:**
  1. Set up a basic environment (consult TA)
  2. Install a text editor: **vi (or gvim)**
  3. Cygwin includes “vi”.

# Use Cygwin

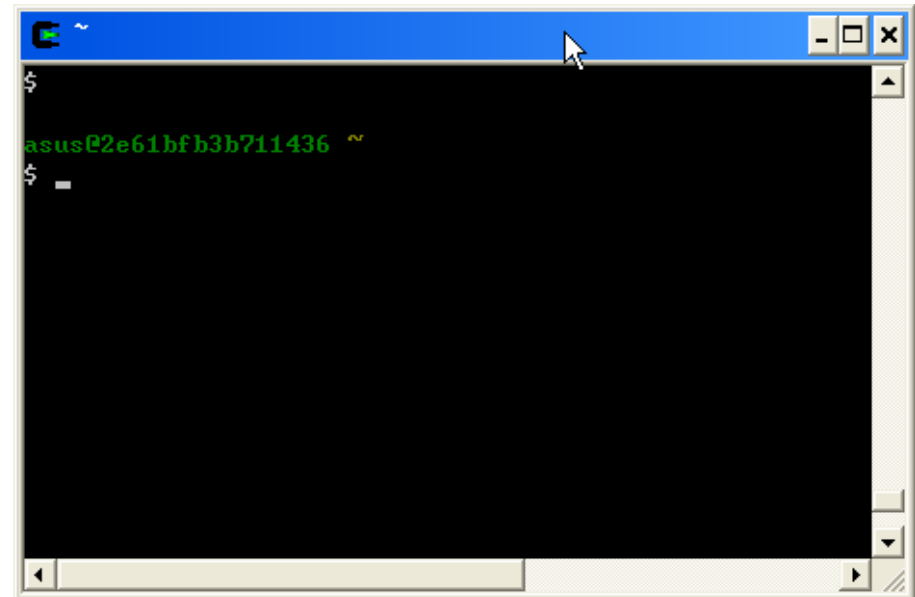
- After successful installation, you'll see the **Cygwin icon** on you desktop.
- Double click the icon, you see a black window pops up.



This window is exactly a Linux window.

You may type in any Linux commands.

You may also choose to install a Linux virtual machine.



# *To access files*

- Use the “mount” command to mount your Windows file system.
- To mount your C: disk
  - **mount c: /c/**
- After that, you can access a file at **C:\mydir\myfile.txt** by typing
  - **cd /c/mydir/**
  - **ls** (listing all files there)
  - **vi myfile.txt** (use vi to edit the file)

# *Edit a text file*

- Cygwin has a home dir (depending on machine)
  - `cd` (just type `cd` at any dir)
  - `pwd` (show the current path)
- You see “/home/[computer\_name]”
- Type
  - `ls -a` (-a means “to list all”)
- You should see a file named “.bashrc” among others.
  - If not, ask TA to create one.
- “.bashrc” is a shell file where you can define some environment variables. Type
  - `vi .bashrc`



# *Text Editor “vi” (or “gvim”)*

- “vi” is a popular text editor developed for UNIX originally.
- It is available in Cygwin.
- There exists a Windows version called “gvim” (a free software).
- Learn some basic text editing commands specific to “vi”.

# *Modify .bashrc*

- At the end of the file **“.bashrc”**
- Add:
  - **alias vi='/c/ "Program Files"/Vim/vim70/gvim'**
  - **(depending on your gvim installation)**
  - **export PATH=".:\$PATH"**
  - **(then you can execute a program directly at the current directory)**
  - **export DISPLAY="localhost:0"**
  - **(needed for running GTK applications with X-windows)**
- **Save “.bashrc”. Then `$ source .bashrc`**
- **Also, the newly started Cygwin window takes effect.**
- **Try to add others if you know Bourne shell.**

# *Start X-Server*

- **The X-window server is included in the Cygwin installation.**
- **You'll see the icon with "X" on your desktop or in the "Start" menu.**
- **Start the X-window server.**
- **This X-Server is needed for displaying the GUI developed by the tool kits with Cygwin – GTK or Qt4.**



# *Xming Server*

- Another “free” X-server “**Xming**” is available on the Internet.
- It is available at: [sourceforge.net/projects/xming](http://sourceforge.net/projects/xming)
- You have to install both the x-server and fonts if decide to use Xming.

# GTK

- [www.gtk.org](http://www.gtk.org)
- **GTK+** is a multi-platform toolkit for creating graphical user interfaces (GUI).
- **GTK+** is free software and part of the **GNU Project**.
- You may download the **GTK windows version**.
  - In the extracted folder, there is a directory called “**example**”.
  - You’ll find some **GTK program examples**.
- **Cygwin has the GTK libraries, anyway.**

# *GTK*

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- **Going through all the example programs is a good way to learn new programming API's.**
- **GUI programming is a little different from other programming.**
  
- **We'll walk through a simple GTK GUI example to see how a GUI program works.**

# *Worm-up Exercise*

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- **Download and install Cygwin and start playing around.**
- **Or, install a Linux virtual machine and familiarize yourself with the Linux OS.**
- **Choose a text editor or an IDE tool for your coding.**