

Running Windows on Linux in the LL812 Computer Lab

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In the Computer Science Lab in LL-812, Microsoft Windows™ is now run as a virtual system from within the Linux host system.



Important: always be sure to shut down the virtual Windows system when you are finished using it, and before logging out of your Linux session.

Terminology: in the following description, and in the Oracle VirtualBox™ interface, the term **Host** key refers to a key that is reserved for control of the VirtualBox display. Currently, the function of **Host** key is assigned to the right-hand Ctrl key. It does not act as a control key within the VirtualBox system. To enter a control sequence use the Ctrl key on the left side of the keyboard.

Note: You can learn about virtualization and the Oracle VirtualBox system by visiting <http://www.virtualbox.org> and reading the documentation.

1 Starting Windows

To run Windows, you must be logged in to a Linux X-windows session using your `erdos` account. You can start the virtual machine in either of two ways:

Command-line From an X-windows Terminal, type the command

```
VirtualBox &
```

Gnome menu From the Gnome Applications menu, select System Tools and then Oracle VM VirtualBox.

Either way, a window should soon appear with the title Oracle VM VirtualBox. The Windows XP system should appear selected, with an indicator showing it is Powered Off.

Click on the green arrow labeled **Start** to boot the Windows XP system.

You may see one or two message boxes explaining how to switch the mouse between the host system (Linux) and the guest system (Windows), and announcing that it is entering full-screen mode. Read these if you are unfamiliar with using a virtual system, then click OK.

When VirtualBox is running, the two Ctrl keys on your keyboard are no longer equivalent. The one on the left remains a normal Ctrl key, but the one on the right becomes a special key, called the **Host** key, used to send special signals to the virtual system. For instance, pressing the **Host** key while VirtualBox is running switches the mouse focus between the virtual (Windows) system and the host (Linux) system.

2 Logging in on Windows

Once the Windows XP virtual system boots, you should see a login screen with the users `Root` and `Student` available. Click on `Student` to log in. No password is required.

3 Fullscreen or Seamless Mode

Once logged in, you will probably prefer to use either Fullscreen Mode or Seamless Mode.

In Fullscreen Mode, the Windows display occupies the whole screen, hiding your Linux desktop. This is the most convenient mode to use if you are working solely in Windows. To enter or leave Fullscreen mode, simultaneously press the **Host** key (right Ctrl key) and the F key. Alternatively, in the VirtualBox console, use the Machine menu to check or uncheck Enter Fullscreen Mode.

In Seamless mode, the Windows desktop disappears. Only the Windows task bar and any open Windows applications remain visible. The Windows applications appear in windows among your Linux windows. This is the most convenient mode to use when you are working with both Linux and Windows applications. To enter or leave Seamless mode, simultaneously press the **Host** key (right Ctrl key) and the L key. Alternatively, in the VirtualBox console, use the Machine menu to check or uncheck Enter Seamless Mode. In Seamless mode, you can access the desktop icons by opening the Desktop in a Windows Explorer window.

4 Logging off from Windows

As usual, logging off from Windows is done by clicking on the Start button and clicking the Log Off button. Note that this does not shut down the virtual Windows system. You must shut it down before you log off from your Linux session. If you log off while the virtual system is running, it will be as if you powered off the computer while Windows was running. This risks corrupting the contents of the hard drive.

5 Shutting down Windows

When you are finished using Windows, you must shut it down. This may be done either by logging out and then selecting Turn Off Computer from the login screen, or directly from your logged-in session by clicking on the Start button and clicking the Shut Down button.

The Linux window containing the Windows virtual system will close automatically once Windows is shut down. Then in the Oracle VirtualBox window, click on the File menu and select Exit.

6 Accessing your Linux home directory from Windows

From within Windows, students can access their `erdos` home directories very easily. A shortcut named Students has been placed on the desktop which connects via the network to the folder on `erdos` containing all of the student home directories. (This folder is called `/u/erdos/students` on the Linux side.) Double-click on the shortcut to open an explorer window containing all the student folders. Scroll down to find your own account and open it to access your files.

When creating projects for the Windows system, it is best to store your work in your `erdos` home directory rather than on the Windows disk, because the Windows system is shared by any other students who use the same machine.

7 Switching between Windows and Linux

You can pop out of the Windows session at any time to work in the Linux system. This does not require logging out of Windows. To switch into Linux, press the **Host** key (right Ctrl key) and the F key. This takes the virtual system out of full-screen mode and makes it a normal window on your Linux desktop. You can use the mouse in the reduced-sized window: press **Host** to switch the mouse between serving Linux and serving Windows. To return to your Windows session in full-screen mode, select the Windows window and again press **Host** and F.

8 Accessing removable media

Removable media include USB flash memory sticks and CD or DVD disks. These can be accessed from within Windows, but it is not totally seamless. Initially, when you insert some removable media into the computer, the Linux system takes ownership of it. Usually, a file browser window will pop up, even if you are in Windows full-screen mode. You will recognize, however, that it is not a Windows Explorer window but a Linux window. You may need to transfer ownership of the media to the Windows system. This requires temporarily switching into Linux, by pressing **Host-F** as described in the previous section. Once you have a reduced-sized window containing the Windows system, follow the instructions below for the type of media:

USB device: Select to the **Devices** menu, **USB Devices**, and click on the box for **USB DISK**. The Linux file browser should disappear, and the device will pop up inside the Windows environment. Return to full-screen mode by pressing **Host-F** again. Remember to click on the **Safely Remove Hardware** icon before removing the USB device from the computer. (If you shut down Windows without removing the USB device, it will reappear on the Linux side. To remove it safely, use the file browser's **File** menu to select **Unmount volume**.)

CD or DVD Often a CD or DVD that has just been inserted will automatically appear also in the Windows system. If so, you can work with it right away, but you will still need to switch to Linux to eject the media. When you do that, it will also disappear from the Windows environment.

If the disk does not appear automatically in Windows, you need to get out of full-screen mode, then on the **Devices** menu, choose **Mount CD/DVD-ROM**, and select the **Host Drive**.