SWE 103 PROJECT STUDY 1 (2025)

INSTALLING LINUX ON A WINDOWS COMPUTER

Due date: 7 October 2025, class time.

Note: This report is generated by Chat-GPT.

1. Method: Windows Subsystem for Linux (WSL) on a Windows Computer

Overview

The **Windows Subsystem for Linux (WSL)** enables users to run a Linux environment directly on Windows without the need for a virtual machine or dual-boot setup. It is especially useful for developers who work across Linux and Windows platforms.

This guide outlines the steps required to install WSL on a Windows 10 or Windows 11 computer.

System Requirements

- **Operating System:** Windows 10 version 2004 and higher (Build 19041 and higher) or Windows 11.
- **Architecture:** x64 or ARM64.
- **Administrator privileges:** Required for installation.

Installation Steps

Method 1: Simplified Installation (Recommended)
Step 1: Open PowerShell as Administrator

- Press `Windows Key`
- Type `PowerShell`
- Right-click on **Windows PowerShell** and choose **Run as administrator**

Step 2: Install WSL

Type the following command and press `Enter`:

```
wsl --install
```

This command will:

- Enable the required Windows features
- Download and install the latest Linux kernel
- Set WSL 2 as the default
- Install the default Linux distribution (usually Ubuntu)

Step 3: Restart Your Computer

You will be prompted to restart. After restarting, WSL will continue setup.

Step 4: Set Up Linux Distribution

After reboot:

- WSL will complete installation
- You'll be prompted to create a UNIX username and password

You're now ready to use WSL!

Method 2: Manual Installation (Advanced)
If you need more control over versions or distributions, follow these manual steps:

1. Enable Required Windows Features

Open PowerShell as Administrator and run:

```
dism.exe /online /enable-feature /featurename:Microsoft-Windows-Subsystem-Linux /all /norestart
```

```
dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart
```

2. Download and Install the Linux Kernel Update Package

Download from:
https://aka.ms/wsl2kernel

Install the MSI package.

3. Set WSL 2 as Default

```
wsl --set-default-version 2
```

4. Install a Linux Distribution

Download from the Microsoft Store, e.g.:

- Ubuntu
- Debian
- Kali Linux
- openSUSE

Or use this command to install a specific distribution (e.g., Ubuntu):

```
wsl --install -d Ubuntu
```

Verifying Installation

Run:

```
wsl --list --verbose
```

You should see your installed distributions and WSL version (1 or 2).

Useful WSL Commands

Command	Description
`wsl`	Launch default Linux shell
`wsl -l -v`	List installed distros and WSL versions
`wsl --set-default-version 2`	Set WSL 2 as default
`wsl --install -d <DistroName>`	Install a specific Linux distribution
`wsl --update`	Update WSL components

Troubleshooting Tips

- **WSL command not found:** Ensure you're on a supported Windows version and have restarted after enabling features.
- **Linux kernel error:** Make sure the kernel package is installed via the official link.
- **Slow performance:** Try setting resource limits or using WSL 1 for lighter tasks.

Conclusion

WSL is a powerful tool for Windows users who want access to Linux environments. With just a few commands, you can have a full Linux distro running alongside your Windows tools. For most users, the `wsl --install` method is the quickest and easiest way to get started.

2. Method: VirtualBox on Windows and Running Linux in a Virtual Machine

Overview

VirtualBox is a powerful open-source virtualization software developed by Oracle. It allows users to run multiple operating systems (OS) on a single physical machine. This guide explains how to install VirtualBox on a Windows PC and set up a Linux virtual machine (VM).

Part 1: Installing VirtualBox on Windows

Step 1: Download VirtualBox

1. Open a web browser and go to: https://www.virtualbox.org
2. Click **Download VirtualBox**.
3. Under **VirtualBox platform packages**, select **Windows hosts** to download the installer.

Step 2: Run the Installer

1. Locate the downloaded `.exe` file (e.g., `VirtualBox-7.x.x-Win.exe`).
2. Double-click to start the installation.
3. Follow the installation wizard:
    - Click **Next** to accept defaults.
    - Choose the installation location (or leave as default).
    - Optionally install network features and USB support.
    - Click **Install**.

4. If prompted by User Account Control, click **Yes**.
5. After installation, click **Finish** to launch VirtualBox.

Part 2: Download a Linux ISO File

Before creating a VM, you need a Linux ISO file.

Step 1: Choose a Linux Distribution

Popular options include:

- **Ubuntu** – beginner-friendly (https://ubuntu.com/download)
- **Debian** – stable and lightweight (https://www.debian.org/distrib/)
- **Fedora** – cutting-edge tech (https://getfedora.org)
- **Kali Linux** – penetration testing (https://www.kali.org/get-kali/)

Step 2: Download ISO

Download the `.iso` file (usually 1–4 GB depending on the distro).

Part 3: Create a New Linux Virtual Machine

Step 1: Launch VirtualBox

1. Open **Oracle VM VirtualBox** from the Start menu.
2. Click **New** in the toolbar.

Step 2: Configure the Virtual Machine

1. **Name**: Enter a name (e.g., "Ubuntu 22.04").
2. **Machine Folder**: Leave default or change.
3. **Type**: Select **Linux**.
4. **Version**: Choose the appropriate version (e.g., **Ubuntu (64-bit)**).
5. Click **Next**.

Step 3: Allocate Memory (RAM)

- Recommended: **2 GB (2048 MB)** or more (depending on your system).
- Click **Next**.

Step 4: Create a Virtual Hard Disk

1. Choose **Create a virtual hard disk now** → **Create**.
2. Select **VDI (VirtualBox Disk Image)** → **Next**.
3. Choose **Dynamically allocated** → **Next**.
4. Set the disk size (e.g., **20 GB** or more) → **Create**.

Part 4: Install Linux in the Virtual Machine

Step 1: Load the ISO

1. Select your VM → Click **Settings**.
2. Go to **Storage** tab.
3. Under **Controller: IDE**, click **Empty**.
4. Click the disk icon → **Choose a disk file**.
5. Select your downloaded Linux `.iso` file → Click **OK**.

Step 2: Start the VM and Install Linux

1. Select the VM and click **Start**.
2. The virtual machine will boot from the ISO.
3. Follow the on-screen installer to:
    - Select language and keyboard
    - Set up username and password
    - Partition disk (use defaults if unsure)
    - Install the OS
4. When prompted, remove the ISO and reboot the VM.

Part 5: Post-Installation Tips

Install Guest Additions

To improve performance, display resolution, and clipboard sharing:

1. Start the Linux VM.
2. From the VM window menu, click:
   `Devices` > `Insert Guest Additions CD image…`
3. Follow the on-screen installation instructions.
4. Reboot the VM when complete.

Part 6: Useful VirtualBox Features

Feature	Description
Shared Folders	Share files between Windows and Linux
Clipboard Integration	Copy/paste between host and guest
Snapshots	Save the current state of VM
Bridged Networking	Make VM appear as a separate device on network
USB Support	Access USB devices from within VM

Conclusion

With VirtualBox, running a Linux OS alongside your Windows installation is straightforward. Whether you're exploring Linux for the first time or using it for development, a virtual machine provides a safe, flexible environment.