

# GATS Companion Installing WSL

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## Overview

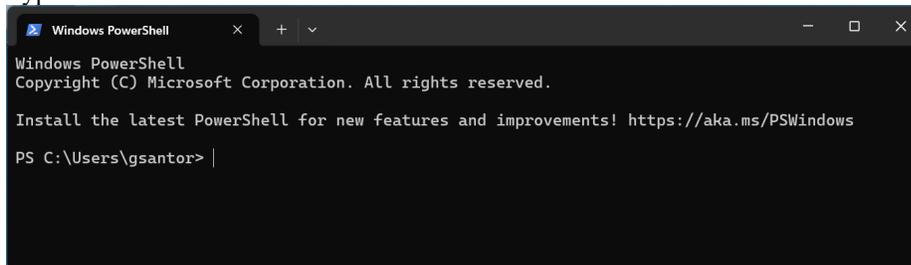
How to install Windows Subsystem for Linux (WSL) on Windows 11.

## Installation

If you have already installed Ubuntu earlier than 24.04.1 LTS then uninstall it (you may wish to backup the files first).

The easiest way to install the latest version of Ubuntu Linux on Windows is to install it from the Windows Terminal.

1. Type “Terminal” in the Windows Search bar and execute.

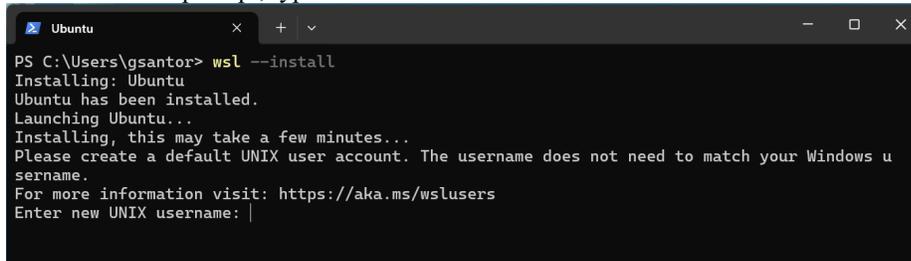


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

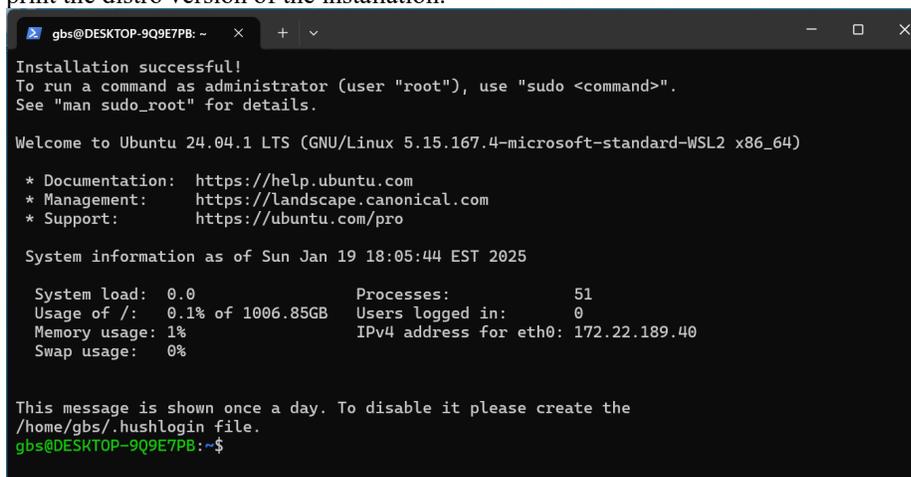
PS C:\Users\gsantor> |
```

2. At the Terminal prompt, type “wsl –install”



```
PS C:\Users\gsantor> wsl --install
Installing: Ubuntu
Ubuntu has been installed.
Launching Ubuntu...
Installing, this may take a few minutes...
Please create a default UNIX user account. The username does not need to match your Windows u
sername.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username: |
```

3. Enter a username and password (anything, but Linux is case-sensitive on both counts). The installation will complete and print the distro version of the installation.



```
Installation successful!
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 5.15.167.4-microsoft-standard-WSL2 x86_64)

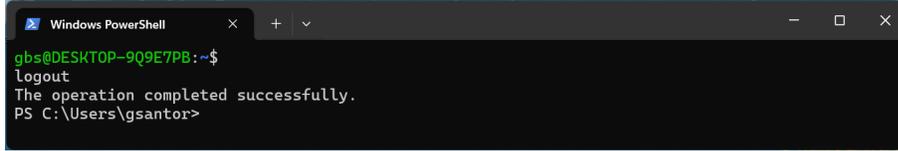
 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Sun Jan 19 18:05:44 EST 2025

System load:  0.0          Processes:    51
Usage of /:   0.1% of 1006.85GB  Users logged in:  0
Memory usage: 1%          IPv4 address for eth0: 172.22.189.40
Swap usage:  0%

This message is shown once a day. To disable it please create the
/home/gbs/.hushlogin file.
gbs@DESKTOP-9Q9E7PB:~$
```

- Exit Linux by typing “exit” (or ^D) at the prompt. This should return you to the original Terminal application.



- Exit the Terminal application.

## Launching Ubuntu

There are several ways to launch Ubuntu once installed.

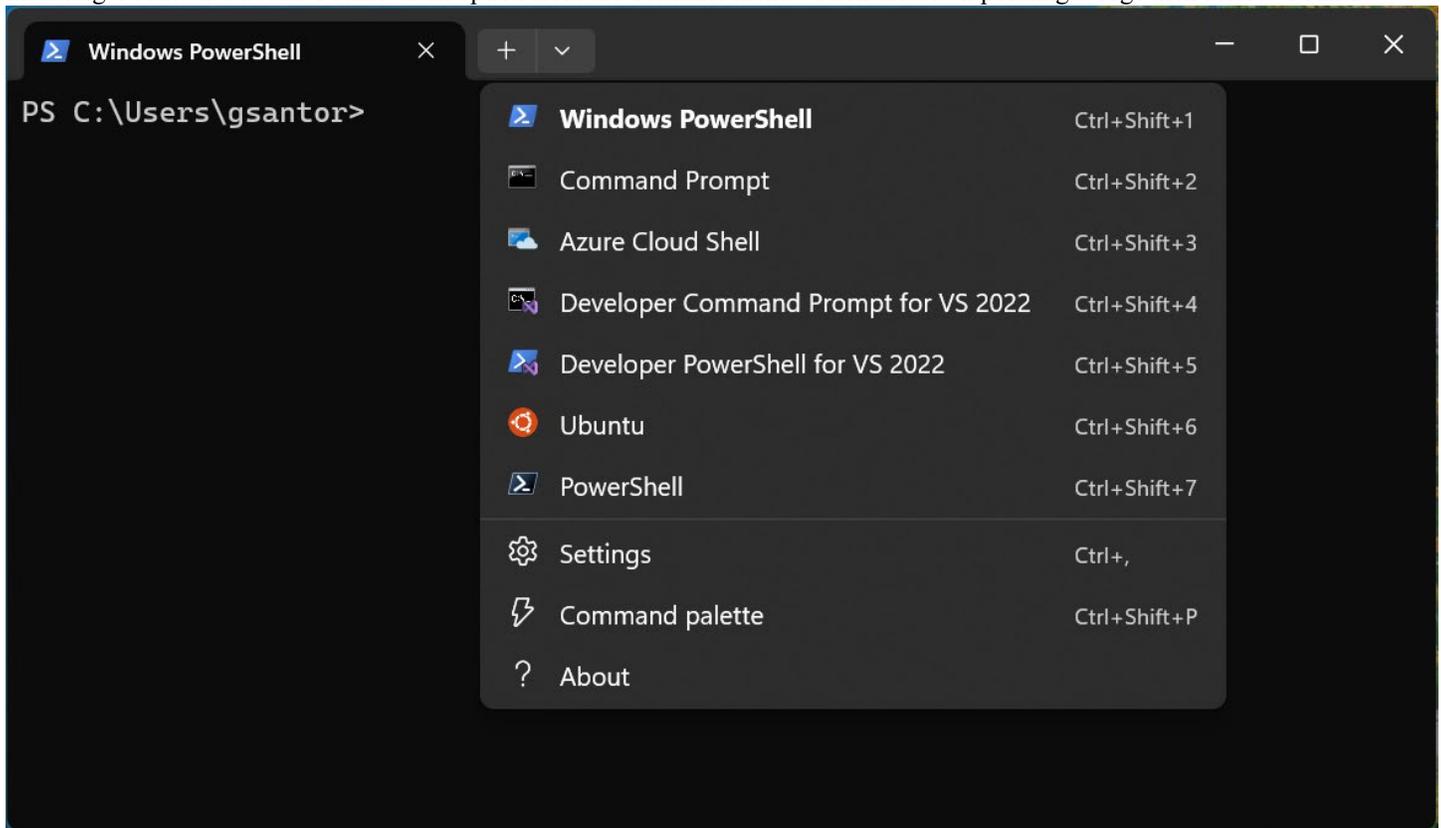
### From the Start menu

Look for Ubuntu icon from the Start menu and double click.



### From the Terminal app shell menu

Installing Ubuntu has added Ubuntu as an option from the Terminal menu. Click the down pointing wedge then select “Ubuntu”

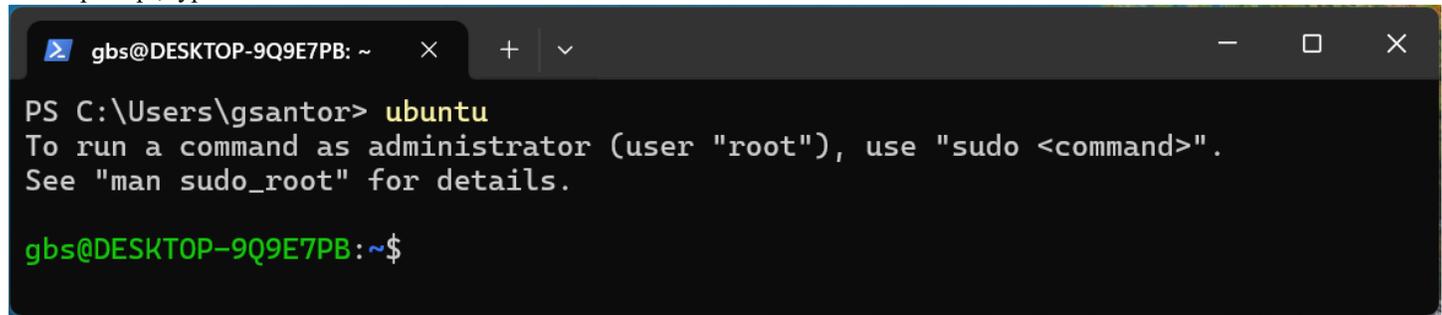


This opens a new window with Ubuntu. Your username and password have been stored and will be automatically entered.

## From another Terminal shell

You can launch ubuntu from **Windows PowerShell** or **Command Prompt**.

At the prompt, type “ubuntu”

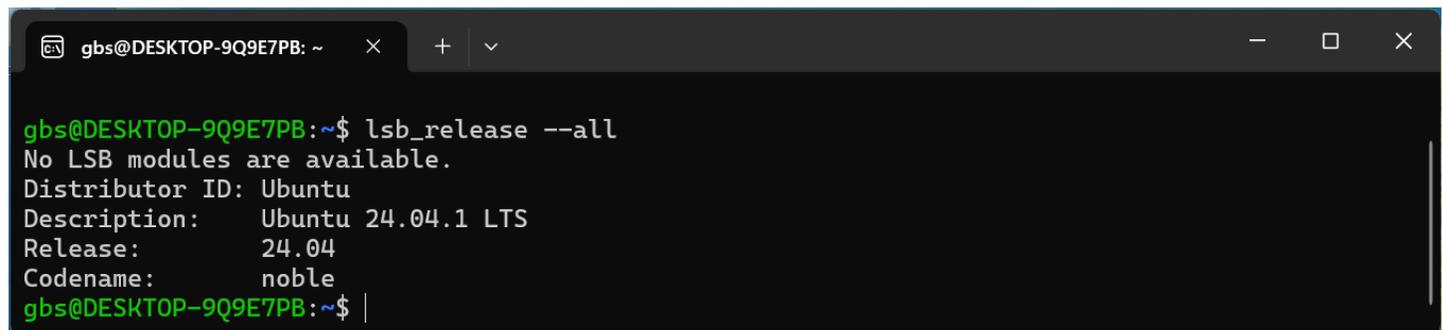


```
gbs@DESKTOP-9Q9E7PB: ~  
PS C:\Users\gsantor> ubuntu  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
gbs@DESKTOP-9Q9E7PB: ~$
```

## Verify the installation

We can verify the installation using the command `lsb_release`. LSB stands for Linux Standard Base, a project to standardize the system structure of multiple Linux distributions, to support open standards for Linux binary applications.

At the console prompt, type: `lsb_release --all`



```
gbs@DESKTOP-9Q9E7PB: ~$ lsb_release --all  
No LSB modules are available.  
Distributor ID: Ubuntu  
Description:    Ubuntu 24.04.1 LTS  
Release:        24.04  
Codename:       noble  
gbs@DESKTOP-9Q9E7PB: ~$
```

# Updating your Installation

At the console prompt, type: “`sudo apt update`”

You will see something like this:

```
gbs@DESKTOP-9Q9E7PB: ~$ sudo apt update
[sudo] password for gbs:
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [586 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [114 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7232 B]
Get:9 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [800 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [171 kB]
Get:12 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.0 kB]
Get:13 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [13.5 kB]
Get:14 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [572 kB]
Get:15 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [110 kB]
Get:16 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:17 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [12.4 kB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [2940 B]
Get:19 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:20 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [356 B]
Get:21 http://archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:22 http://archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:23 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:24 http://archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:25 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:26 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:27 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [775 kB]
Get:28 http://archive.ubuntu.com/ubuntu noble-updates/main Translation-en [176 kB]
Get:29 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [151 kB]
Get:30 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [974 kB]
Get:31 http://archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [242 kB]
Get:32 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [309 kB]
Get:33 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [19.9 kB]
]
Get:34 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [583 kB]
Get:35 http://archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [113 kB]
Get:36 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:37 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [16.0 kB]
Get:38 http://archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3844 B]
Get:39 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:40 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [552 B]
]
Get:41 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:42 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:43 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10.7 kB]
Get:44 http://archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [10.8 kB]
Get:45 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.7 kB]
Get:46 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1104 B]
Get:47 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:48 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
]
Get:49 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:50 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
]
Fetched 31.8 MB in 4s (7671 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
7 packages can be upgraded. Run 'apt list --upgradable' to see them.
gbs@DESKTOP-9Q9E7PB:~$
```

# Installing development tools

The easiest way to get a development environment for Linux is to install the build-essential package.

To do so, type: `sudo apt install build-essential` at the Linux command prompt.

The beginning of the installation will look like this:

```
gbs@DESKTOP-9Q9E7PB: ~  
gbs@DESKTOP-9Q9E7PB:~$ sudo apt install build-essential  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  bzip2 cpp cpp-13 cpp-13-x86-64-linux-gnu cpp-x86-64-linux-gnu dpkg-dev fakeroot g++  
  g++-13 g++-13-x86-64-linux-gnu g++-x86-64-linux-gnu gcc gcc-13 gcc-13-base  
  gcc-13-x86-64-linux-gnu gcc-x86-64-linux-gnu libalgorithm-diff-perl  
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libaom3 libasan8 libatomic1  
  libc-dev-bin libc-devtools libc6-dev libcc1-0 libcrypt-dev libde265-0 libdpkg-perl  
  libfakeroot libfile-fcntllock-perl libgcc-13-dev libgd3 libgomp1 libheif-plugin-aomdec
```

This is long one, so I won't show the whole of the output.

You'll be prompted for addition installation files, respond with 'Y' to add them.

It should finish up with something like:

```
gbs@DESKTOP-9Q9E7PB: ~  
update-alternatives: using /usr/bin/g++ to provide /usr/bin/c++ (c++) in auto mode  
Setting up build-essential (12.10ubuntu1) ...  
Setting up libheif1:amd64 (1.17.6-1ubuntu4.1) ...  
Setting up libgd3:amd64 (2.3.3-9ubuntu5) ...  
Setting up libc-devtools (2.39-0ubuntu8.3) ...  
Setting up libheif-plugin-aomdec:amd64 (1.17.6-1ubuntu4.1) ...  
Setting up libheif-plugin-libde265:amd64 (1.17.6-1ubuntu4.1) ...  
Setting up libheif-plugin-aomenc:amd64 (1.17.6-1ubuntu4.1) ...  
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...  
Processing triggers for man-db (2.12.0-4build2) ...  
gbs@DESKTOP-9Q9E7PB:~$
```

## Testing a C program

Enter the following program with your favour editor (I used vim). If you are unfamiliar with UNIX editors, you can use a Windows editor (try: "notepad.exe hello.c")

```
hello.c  
#include <stdio.h>  
  
int main() {  
    printf("hello, C-world\n");  
    return 0;  
}
```

You can confirm the file was created using the "ls" command.

```
gbs@DESKTOP-9Q9E7PB: ~  
gbs@DESKTOP-9Q9E7PB:~$ notepad.exe hello.c  
gbs@DESKTOP-9Q9E7PB:~$ ls  
hello.c  
gbs@DESKTOP-9Q9E7PB:~$
```

Build and execute the program. At the prompt, type: `cc hello.c -o helloc`

Execute the program by typing at the prompt: `./helloc`

```
gbs@DESKTOP-9Q9E7PB: ~  
gbs@DESKTOP-9Q9E7PB:~$ cc hello.c -o helloc  
gbs@DESKTOP-9Q9E7PB:~$ ls  
hello.c helloc  
gbs@DESKTOP-9Q9E7PB:~$ ./helloc  
Hello, world!  
gbs@DESKTOP-9Q9E7PB:~$
```

## Testing a C++ program

Enter the following program with your favour editor (I used vim).

```
hello.cpp  
#include <iostream>  
  
int main() {  
    std::cout << "Hello, C++-world\n";  
}
```

At the prompt, type: `g++ hello.cpp -o helloc++`

Execute the program by typing at the prompt: `./helloc++`

```
gbs@DESKTOP-9Q9E7PB: ~  
gbs@DESKTOP-9Q9E7PB:~$ notepad.exe hello.cpp  
gbs@DESKTOP-9Q9E7PB:~$ g++ hello.cpp -o helloc++  
gbs@DESKTOP-9Q9E7PB:~$ ls  
hello.c hello.cpp helloc helloc++  
gbs@DESKTOP-9Q9E7PB:~$ ./helloc++  
Hello, C++ world!  
gbs@DESKTOP-9Q9E7PB:~$
```

## FAQs

**Question:** What does LTS stand for?

**Answer:** LTS stands for *Long Term Support* which guarantees five years of security patching for the Ubuntu application you have installed.

# References

## Installation

[Install WSL | Microsoft Learn](#)

[Running Visual Studio Code on Linux](#)

## Document History

Version	Date	Activity
1.0.0	2023-09-24	Document created.
1.1.0	2025-01-19	Updated to install a newer version of Ubuntu and g++