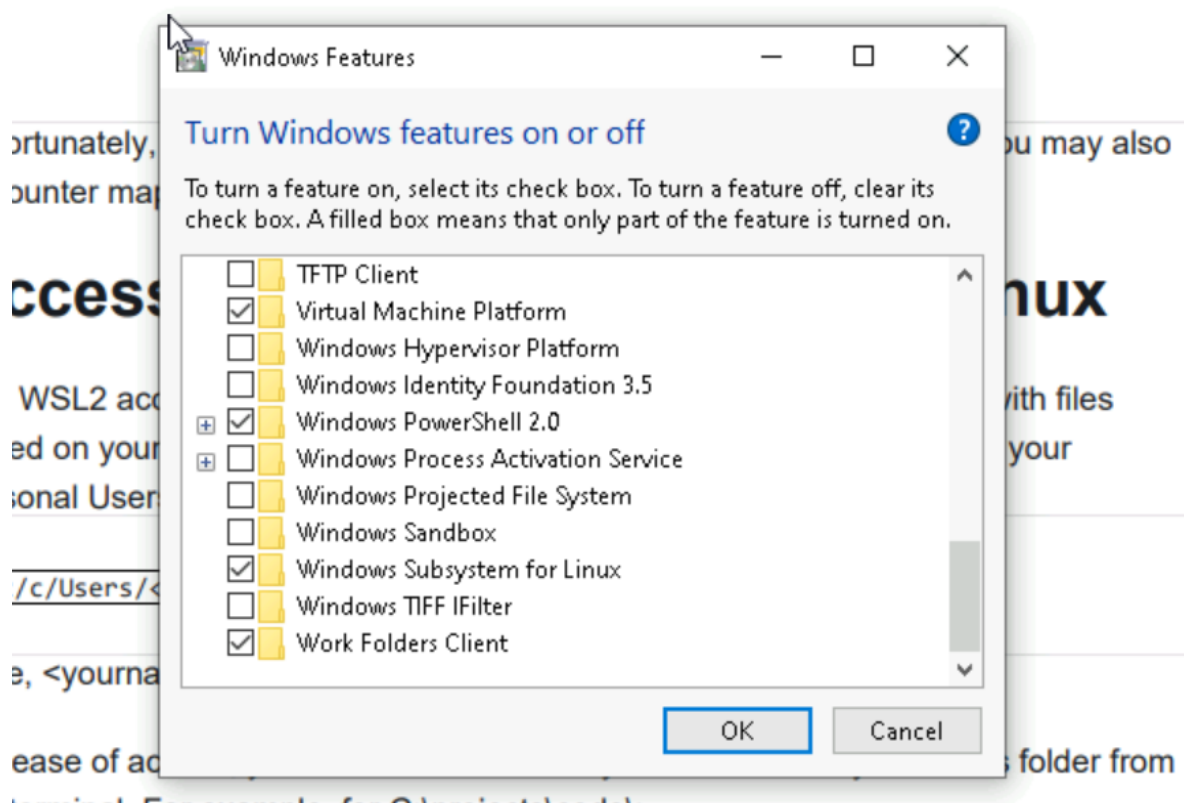


WSL ASSIGNMENT

Enable WSL on Windows 10

Step 1: Enable Windows Features

1. Access Turn Windows features on or off:
 - Press the Start button and type “features.”
 - Select Turn Windows features on or off.
2. Enable Virtual Machine Platform and Windows Subsystem for Linux:
 - In the features window, check Virtual Machine Platform and Windows Subsystem for Linux.
 - Click OK to apply.



Step 2: Download a Linux Distro

1. Open PowerShell and list available Linux distros with the following command:
wsl --list --online
2. Install the default Linux distro (Ubuntu 20.04):

wsl --install

wsl --install -d Debian

```
huthin@4f7e9c7e4ccb5e3: ~
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\Administrator> wsl --list --online
The following is a list of valid distributions that can be installed.
Install using 'wsl.exe --install <Distro>'.

NAME                                FRIENDLY NAME
Ubuntu                              Ubuntu
Debian                              Debian GNU/Linux
kali-linux                          Kali Linux Rolling
Ubuntu-18.04                        Ubuntu 18.04 LTS
Ubuntu-20.04                        Ubuntu 20.04 LTS
Ubuntu-22.04                        Ubuntu 22.04 LTS
Ubuntu-24.04                        Ubuntu 24.04 LTS
OracleLinux_7.9                    Oracle Linux 7.9
OracleLinux_8.7                    Oracle Linux 8.7
OracleLinux_9.1                    Oracle Linux 9.1
openSUSE-Leap-15.6                 openSUSE Leap 15.6
SUSE-Linux-Enterprise-15-SP5       SUSE Linux Enterprise 15 SP5
SUSE-Linux-Enterprise-15-SP6       SUSE Linux Enterprise 15 SP6
openSUSE-Tumbleweed                openSUSE Tumbleweed
PS C:\Users\Administrator> wsl --install
Ubuntu is already installed.
Launching Ubuntu...
huthin@4f7e9c7e4ccb5e3: ~$ exit
logout
The operation completed successfully.
PS C:\Users\Administrator> wsl --install -d Debian
Installing: Debian GNU/Linux
Debian GNU/Linux has been installed.
Launching Debian GNU/Linux...
Installing, this may take a few minutes...
Please create a default UNIX user account. The username does not need to match your Windows username.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username: huthin
New password:
Retype new password:
passwd: password updated successfully
Installation successful
huthin@4f7e9c7e4ccb5e3: ~$ ls
huthin@4f7e9c7e4ccb5e3: ~$
```

```
huthin@4f7e9c7e4ccb5e3: ~
OracleLinux_7.9                    Oracle Linux 7.9
OracleLinux_8.7                    Oracle Linux 8.7
OracleLinux_9.1                    Oracle Linux 9.1
openSUSE-Leap-15.6                 openSUSE Leap 15.6
SUSE-Linux-Enterprise-15-SP5       SUSE Linux Enterprise 15 SP5
SUSE-Linux-Enterprise-15-SP6       SUSE Linux Enterprise 15 SP6
openSUSE-Tumbleweed                openSUSE Tumbleweed
PS C:\Users\Administrator> wsl --install
Ubuntu is already installed.
Launching Ubuntu...
huthin@4f7e9c7e4ccb5e3: ~$ exit
logout
The operation completed successfully.
PS C:\Users\Administrator> wsl --install -d Debian
Installing: Debian GNU/Linux
Debian GNU/Linux has been installed.
Launching Debian GNU/Linux...
Installing, this may take a few minutes...
Please create a default UNIX user account. The username does not need to match your Windows username.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username: huthin
New password:
Retype new password:
passwd: password updated successfully
Installation successful
huthin@4f7e9c7e4ccb5e3: ~$ ls
huthin@4f7e9c7e4ccb5e3: ~$ sudo apt update
[sudo] password for huthin:
Get:1 http://deb.debian.org/debian bookworm InRelease [151 kB]
Get:2 http://security.debian.org/debian-security bookworm-security InRelease [46.0 kB]
Get:3 http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
Get:4 http://ftp.debian.org/debian bookworm-backports InRelease [59.0 kB]
Get:5 http://security.debian.org/debian-security bookworm-security/main amd64 Packages [243 kB]
Get:6 http://security.debian.org/debian-security bookworm-security/main Translation-en [144 kB]
Get:7 http://deb.debian.org/debian bookworm/main amd64 Packages [792 kB]
Get:8 http://ftp.debian.org/debian bookworm-backports/main amd64 Packages [282 kB]
Get:9 http://ftp.debian.org/debian bookworm-backports/main Translation-en [235 kB]
Get:10 http://deb.debian.org/debian bookworm/main Translation-en [6,109 kB]
Get:11 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [13.5 kB]
Get:12 http://deb.debian.org/debian bookworm-updates/main Translation-en [16.0 kB]
Fetched 16.1 MB in 4s (4,524 kB/s)
Reading package lists... Done
Building dependency tree... Done
10 packages can be upgraded. Run 'apt list --upgradable' to see them.
W: Repository 'http://deb.debian.org/debian bookworm InRelease' changed its 'Version' value from '12.8' to '12.9'
huthin@4f7e9c7e4ccb5e3: ~$
```

Step 3: Launch the Linux Distro

1. After installation, you can launch the Linux distro:
 - From the Start menu (search for the Linux distro).
 - From Windows Terminal (if installed).

- From PowerShell by typing wsl or bash
2. Install the default Linux distro (Ubuntu 20.04):
wsl --install

Step 4: Update Linux

1. To ensure your Linux distro is up to date, run the following commands in the Linux terminal:

The first screenshot shows the initial setup of Debian in a WSL environment. The user runs 'wsl --install' and then 'exit' to launch Ubuntu. They then run 'exit' to return to the Windows command prompt. The terminal shows the successful installation of Debian GNU/Linux. The user then runs 'ls' and 'sudo apt update' to update the package lists. The output shows the sources list being updated with mirrors from the Debian bookworm repository.

```

huthin@4f7e8c7e4ccb5e3: ~
OracleLinux_7_9 Oracle Linux 7.9
OracleLinux_8_7 Oracle Linux 8.7
OracleLinux_9_1 Oracle Linux 9.1
openSUSE-Leap-15.6 openSUSE Leap 15.6
SUSE-Linux-Enterprise-15-SP5 SUSE Linux Enterprise 15 SP5
SUSE-Linux-Enterprise-15-SP6 SUSE Linux Enterprise 15 SP6
openSUSE-Tumbleweed openSUSE Tumbleweed
PS C:\Users\Administrator> wsl --install
Ubuntu is already installed.
Launching Ubuntu...
huthin@4f7e8c7e4ccb5e3: $ exit
logout
The operation completed successfully.
PS C:\Users\Administrator> wsl --install -d Debian
Installing: Debian GNU/Linux
Debian GNU/Linux has been installed.
Launching Debian GNU/Linux...
Installing, this may take a few minutes...
Please create a default UNIX user account. The username does not need to match your Windows username.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username: huthin
New password:
Retype new password:
passwd: password updated successfully
Installation successful
huthin@4f7e8c7e4ccb5e3: $ ls
huthin@4f7e8c7e4ccb5e3: $ sudo apt update
[sudo] password for huthin:
Set1: http://deb.debian.org/debian bookworm InRelease [151 kB]
Set2: http://security.debian.org/debian-security bookworm-security InRelease [48.0 kB]
Set3: http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
Set4: http://ftp.debian.org/debian bookworm-backports InRelease [59.0 kB]
Set5: http://security.debian.org/debian-security bookworm-security/main amd64 Packages [243 kB]
Set6: http://security.debian.org/debian-security bookworm-security/main Translation-en [144 kB]
Set7: http://deb.debian.org/debian bookworm/main amd64 Packages [4,792 kB]
Set8: http://ftp.debian.org/debian bookworm-backports/main amd64 Packages [282 kB]
Set9: http://ftp.debian.org/debian bookworm-backports/main Translation-en [235 kB]
Set10: http://deb.debian.org/debian bookworm/main Translation-en [6,109 kB]
Set11: http://deb.debian.org/debian bookworm-updates/main amd64 Packages [13.5 kB]
Set12: http://deb.debian.org/debian bookworm-updates/main Translation-en [16.0 kB]
Fetched 16.1 MB in 4s (4,524 kB/s)
Reading package lists... Done
Building dependency tree... Done
18 packages can be upgraded. Run 'apt list --upgradable' to see them.
N: Repository 'http://deb.debian.org/debian bookworm InRelease' changed its 'Version' value from '12.8' to '12.9'
huthin@4f7e8c7e4ccb5e3: $

```

The second screenshot shows the output of 'sudo apt upgrade'. It lists the packages to be upgraded, including base-files, bsdutils, fdisk, libblkid1, libmount1, libsmartcols1, libsystemd-shared, libsystemd0, libudev1, libuuid1, mount, systemd, systemd-sysv, tzdata, udev, util-linux, and util-linux-extra. The user confirms the upgrade, and the terminal shows the progress of downloading and installing the new versions of these packages.

```

huthin@4f7e8c7e4ccb5e3: ~
Building dependency tree... Done
18 packages can be upgraded. Run 'apt list --upgradable' to see them.
N: Repository 'http://deb.debian.org/debian bookworm InRelease' changed its 'Version' value from '12.8' to '12.9'
huthin@4f7e8c7e4ccb5e3: $ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Calculating upgrade... Done
The following packages will be upgraded:
  base-files bsdutils fdisk libblkid1 libmount1 libsmartcols1 libsystemd-shared libsystemd0 libudev1 libuuid1 mount systemd systemd-sysv tzdata udev util-linux
  util-linux-extra
18 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 9,583 kB of archives.
After this operation, 156 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Set1: http://deb.debian.org/debian bookworm/main amd64 base-files amd64 12.4+deb12u9 [70.8 kB]
Set2: http://deb.debian.org/debian bookworm/main amd64 bsdutils amd64 1:2.38.1-5+deb12u3 [94.4 kB]
Set3: http://deb.debian.org/debian bookworm/main amd64 libsmartcols1 amd64 2.38.1-5+deb12u3 [187 kB]
Set4: http://deb.debian.org/debian bookworm/main amd64 util-linux-extra amd64 2.38.1-5+deb12u3 [111 kB]
Set5: http://deb.debian.org/debian bookworm/main amd64 util-linux amd64 2.38.1-5+deb12u3 [1,177 kB]
Set6: http://deb.debian.org/debian bookworm/main amd64 mount amd64 2.38.1-5+deb12u3 [134 kB]
Set7: http://deb.debian.org/debian bookworm/main amd64 libblkid1 amd64 2.38.1-5+deb12u3 [147 kB]
Set8: http://deb.debian.org/debian bookworm/main amd64 libuuid1 amd64 2.38.1-5+deb12u3 [28.8 kB]
Set9: http://deb.debian.org/debian bookworm/main amd64 libfdisk1 amd64 2.38.1-5+deb12u3 [194 kB]
Set10: http://deb.debian.org/debian bookworm/main amd64 libmount1 amd64 2.38.1-5+deb12u3 [166 kB]
Set11: http://deb.debian.org/debian bookworm/main amd64 systemd amd64 252.33-1+deb12u1 [3,036 kB]
Set12: http://deb.debian.org/debian bookworm/main amd64 libsystemd-shared amd64 252.33-1+deb12u1 [1,691 kB]
Set13: http://deb.debian.org/debian bookworm/main amd64 libsystemd0 amd64 252.33-1+deb12u1 [332 kB]
Set14: http://deb.debian.org/debian bookworm/main amd64 systemd-sysv amd64 252.33-1+deb12u1 [42.5 kB]
Set15: http://deb.debian.org/debian bookworm/main amd64 udev amd64 252.33-1+deb12u1 [1,704 kB]
Set16: http://deb.debian.org/debian bookworm/main amd64 libudev1 amd64 252.33-1+deb12u1 [109 kB]
Set17: http://deb.debian.org/debian bookworm/main amd64 tzdata all 2024b-0+deb12u1 [298 kB]
Set18: http://deb.debian.org/debian bookworm/main amd64 fdisk amd64 2.38.1-5+deb12u3 [141 kB]
Fetched 9,583 kB in 0s (19.3 MB/s)
Preconfiguring packages ...
(Reading database ... 9538 files and directories currently installed.)
Preparing to unpack .../base-files_12.4+deb12u9_amd64.deb ...
Unpacking base-files (12.4+deb12u9) over (12.4+deb12u8) ...
Setting up base-files (12.4+deb12u9) ...
Installing new version of config file /etc/debian_version ...
(Reading database ... 9538 files and directories currently installed.)
Preparing to unpack .../bsdutils_1:2.38.1-5+deb12u3_amd64.deb ...
Unpacking bsdutils (1:2.38.1-5+deb12u3) over (1:2.38.1-5+deb12u2) ...
Setting up bsdutils (1:2.38.1-5+deb12u3) ...
(Reading database ... 9538 files and directories currently installed.)
Preparing to unpack .../libsmartcols1_2.38.1-5+deb12u3_amd64.deb ...
Unpacking libsmartcols1:amd64 (2.38.1-5+deb12u3) over (2.38.1-5+deb12u2) ...

```

Step 5: Switch Between WSL1 and WSL2

```
Administrator: Windows PowerShell
Current default time zone: 'Asia/Kolkata'
Local time is now: Tue Feb 4 14:36:25 IST 2025.
Universal Time is now: Tue Feb 4 09:06:25 UTC 2025.
Run 'dpkg-reconfigure tzdata' if you wish to change it.

Setting up udev (252.33-1-deb12u1) ...
Processing triggers for libc-bin (2.36-9+deb12u9) ...
huthin@4f7e8c7e4ccb5e3:~$ exit
logout
The operation completed successfully.
PS C:\Users\Administrator> wsl --list --verbose
  NAME                STATE      VERSION
* docker-desktop      Stopped    2
  Ubuntu              Stopped    2
  Debian              Running     2
PS C:\Users\Administrator> wsl --set-version Ubuntu 2
For information on key differences with WSL 2 please visit https://aka.ms/wsl2
Conversion in progress, this may take a few minutes.
The distribution is already the requested version.
Error code: Wsl/Service/WSL_E_VM_NODE_INVALID_STATE
PS C:\Users\Administrator> wsl --set-version Ubuntu 1
Conversion in progress, this may take a few minutes.
The operation completed successfully.
PS C:\Users\Administrator> wsl --list
Windows Subsystem for Linux Distributions:
  Ubuntu
  Debian
PS C:\Users\Administrator>
```

```
huthin@4f7e8c7e4ccb5e3: /mnt/c/Users/Administrator
Current default time zone: 'Asia/Kolkata'
Local time is now: Tue Feb 4 14:36:25 IST 2025.
Universal Time is now: Tue Feb 4 09:06:25 UTC 2025.
Run 'dpkg-reconfigure tzdata' if you wish to change it.

Setting up udev (252.33-1-deb12u1) ...
Processing triggers for libc-bin (2.36-9+deb12u9) ...
huthin@4f7e8c7e4ccb5e3:~$ exit
logout
The operation completed successfully.
PS C:\Users\Administrator> wsl --list --verbose
  NAME                STATE      VERSION
* docker-desktop      Stopped    2
  Ubuntu              Stopped    2
  Debian              Running     2
PS C:\Users\Administrator> wsl --set-version Ubuntu 2
For information on key differences with WSL 2 please visit https://aka.ms/wsl2
Conversion in progress, this may take a few minutes.
The distribution is already the requested version.
Error code: Wsl/Service/WSL_E_VM_NODE_INVALID_STATE
PS C:\Users\Administrator> wsl --set-version Ubuntu 1
Conversion in progress, this may take a few minutes.
The operation completed successfully.
PS C:\Users\Administrator> wsl --list
Windows Subsystem for Linux Distributions:
  Ubuntu
  Debian
PS C:\Users\Administrator> wsl --setDefault ubuntu
The operation completed successfully.
PS C:\Users\Administrator> wsl --user huthin
huthin@4f7e8c7e4ccb5e3: /mnt/c/Users/Administrator$
```

Step 6: Move or Clone Your Linux Disk Image

```
Administrator: Windows PowerShell
bruthin@4f7e6c7e4ccb5e3: /mnt/c/Users/Administrator$ exit
logout
PS C:\Users\Administrator> wsl --export Ubuntu D:\backup\ubuntu.tar
The system cannot find the path specified.
Error code: WSL/ERROR_PATH_NOT_FOUND
PS C:\Users\Administrator> mkdir D:\backup

Directory: D:\

Mode                LastWriteTime         Length Name
----                -
d-----          04-02-2025      14:42         backup

PS C:\Users\Administrator> wsl --export Ubuntu D:\backup\ubuntu.tar
Export in progress, this may take a few minutes.
The operation completed successfully.
PS C:\Users\Administrator>
```

```
Administrator: Windows PowerShell

PS C:\Users\Administrator> wsl --export Ubuntu D:\backup\ubuntu.tar
Export in progress, this may take a few minutes.
The operation completed successfully.
PS C:\Users\Administrator> wsl --unregister Ubuntu
Unregistering.
The operation completed successfully.
PS C:\Users\Administrator> mkdir D:\wsl

Directory: D:\

Mode                LastWriteTime         Length Name
----                -
d-----          04-02-2025      14:44         wsl

PS C:\Users\Administrator> wsl --import Ubuntu D:\wsl\ D:\backup\ubuntu.tar
Import in progress, this may take a few minutes.
The operation completed successfully.
PS C:\Users\Administrator>
```

```
Administrator: Windows PowerShell

PS C:\Users\Administrator> wsl --export Ubuntu D:\backup\ubuntu.tar
Export in progress, this may take a few minutes.
The operation completed successfully.
PS C:\Users\Administrator> wsl --unregister Ubuntu
Unregistering.
The operation completed successfully.
PS C:\Users\Administrator> mkdir D:\wsl

Directory: D:\

Mode                LastWriteTime         Length Name
----                -
d-----          04-02-2025         14:44         wsl

PS C:\Users\Administrator> wsl --import Ubuntu D:\wsl\ D:\backup\ubuntu.tar
Import in progress, this may take a few minutes.
The operation completed successfully.
PS C:\Users\Administrator> wsl --import Clone01 D:\wsl\ D:\backup\ubuntu.tar
Import in progress, this may take a few minutes.
The supplied install location is already in use.
Error code: Wsl/Service/RegisterDistro/ERROR_FILE_EXISTS
PS C:\Users\Administrator> wsl --import Another D:\wsl\ D:\backup\ubuntu.tar
Import in progress, this may take a few minutes.
The supplied install location is already in use.
Error code: Wsl/Service/RegisterDistro/ERROR_FILE_EXISTS
PS C:\Users\Administrator>
```

Step 7: Set the Default User for Other Distros

```
GNU nano 7.2 /etc/wsl.conf
[root]
systemd=true
```