Windows Subsystem for Linux Installation Guide for Windows 10

05/12/2020 • 4 minutes to read • 👤 👤 👤 👤 👤 +17

In this article

Install the Windows Subsystem for Linux

Before installing any Linux distributions on Windows, you must enable the "Windows Subsystem for Linux" optional feature.

Open PowerShell as Administrator and run:

PowerShell	🗐 Copy

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

To only install WSL 1, you should now restart your machine and move on to Install your Linux distribution of choice, otherwise wait to restart and move on to update to WSL 2. Read more about Comparing WSL 2 and WSL 1.

Update to WSL 2

To update to WSL 2, you must meet the follow criteria:

- Running Windows 10, updated to version 2004, **Build 19041** or higher.

- Check your Windows version by selecting the **Windows logo key + R**, type

winver, select **OK**. (Or enter the `ver` command in Windows Command Prompt). Please [update to the latest Windows version](#) if your build is lower than 19041. [Get Windows Update Assistant](#).

Enable the 'Virtual Machine Platform' optional component

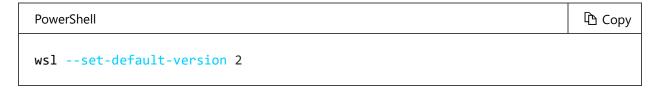Before installing WSL 2, you must enable the "Virtual Machine Platform" optional feature.

Open PowerShell as Administrator and run:

PowerShell	Copy

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

Restart your machine to complete the WSL install and update to WSL 2.

Set WSL 2 as your default version

Run the following command in PowerShell to set WSL 2 as the default version when installing a new Linux distribution:

PowerShell	Copy

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

You might see this message after running that command: `WSL 2 requires an update to its kernel component. For information please visit https://aka.ms/wsl2kernel` please follow the link and install the MSI from that page on our documentation to install a Linux kernel on your machine for WSL 2 to use. Once you have the kernel installed, please run the command again and it should complete successfully without showing the message.

> ⓘ **Note**
>
> The update from WSL 1 to WSL 2 may take several minutes to complete depending on the size of your targeted distribution. If you are running an older (legacy) installation of WSL 1 from Windows 10 Anniversary Update or Creators Update, you

may encounter an update error. Follow these instructions to **uninstall and remove any legacy distributions**.
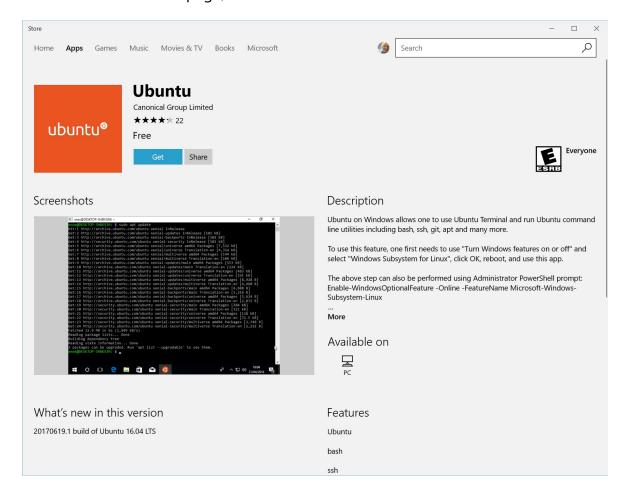
Install your Linux distribution of choice

1. Open the Microsoft Store and select your favorite Linux distribution.

The following links will open the Microsoft store page for each distribution:

- Ubuntu 16.04 LTS
- Ubuntu 18.04 LTS
- Ubuntu 20.04 LTS
- openSUSE Leap 15.1
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 15 SP1
- Kali Linux
- Debian GNU/Linux
- Fedora Remix for WSL
- Pengwin
- Pengwin Enterprise
- Alpine WSL

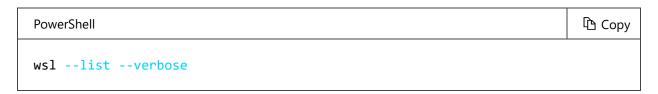2. From the distribution's page, select "Get".

Set up a new distribution

The first time you launch a newly installed Linux distribution, a console window will open and you'll be asked to wait for a minute or two for files to de-compress and be stored on your PC. All future launches should take less than a second.

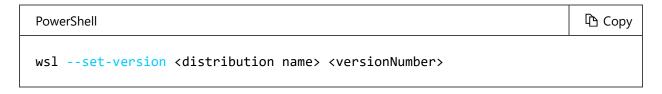You will then need to create a user account and password for your new Linux distribution.

```
■ Ubuntu                                                    —   □   ✕

Installing, this may take a few minutes...
Installation successful!
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:
```

Set your distribution version to WSL 1 or WSL 2

You can check the WSL version assigned to each of the Linux distributions you have installed by opening the PowerShell command line and entering the command (only available in [Windows Build 19041 or higher](#)): `wsl -l -v`
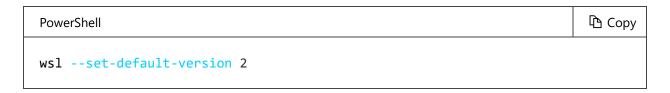
PowerShell	⎘ Copy
`wsl --list --verbose`	

To set a distribution to be backed by either version of WSL please run:

PowerShell	⎘ Copy
`wsl --set-version <distribution name> <versionNumber>`	

Make sure to replace `<distribution name>` with the actual name of your distribution and `<versionNumber>` with the number '1' or '2'. You can change back to WSL 1 at anytime by running the same command as above but replacing the '2' with a '1'.

Additionally, if you want to make WSL 2 your default architecture you can do so with this command:
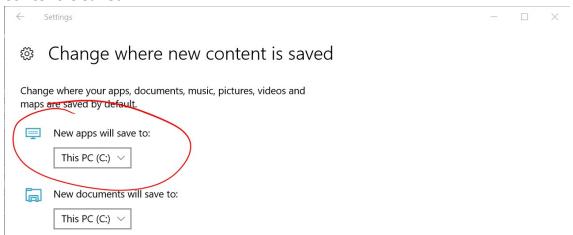
PowerShell	⎘ Copy

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

This will set the version of any new distribution installed to WSL 2.

Troubleshooting installation

Below are related errors and suggested fixes. Refer to the WSL troubleshooting page for other common errors and their solutions.

- **Installation failed with error 0x80070003**
  - The Windows Subsystem for Linux only runs on your system drive (usually this is your `c:` drive). Make sure that distributions are stored on your system drive:
  - Open **Settings** -> **Storage** -> **More Storage Settings: Change where new content is saved**

- **WslRegisterDistribution failed with error 0x8007019e**
  - The Windows Subsystem for Linux optional component is not enabled:
  - Open **Control Panel** -> **Programs and Features** -> **Turn Windows Feature on or off** -> Check **Windows Subsystem for Linux** or using the PowerShell cmdlet mentioned at the beginning of this article.

- **Installation failed with error 0x80070003 or error 0x80370102**
  - Please make sure that virtualization is enabled inside of your computer's BIOS. The instructions on how to do this will vary from computer to computer, and will most likely be under CPU related options.

- **Error when trying to upgrade:** `Invalid command line option: wsl --set-version`

`Ubuntu 2`

○ Please make sure that you have the Windows Subsystem for Linux enabled, and that you're using Windows Build version 19041 or higher. To enable WSL run this command in a PowerShell prompt with admin privileges: `Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Windows-Subsystem-Linux`. You can find the full WSL install instructions here.

- **The requested operation could not be completed due to a virtual disk system limitation. Virtual hard disk files must be uncompressed and unencrypted and must not be sparse.**
  ○ Please check WSL GitHub thread #4103 where this issue is being tracked for updated information.

- **The term 'wsl' is not recognized as the name of a cmdlet, function, script file, or operable program.**
  ○ Ensure that the Windows Subsystem for Linux Optional Component is installed. Additionally, if you are using an ARM64 device and running this command from PowerShell, you will receive this error. Instead run `wsl.exe` from PowerShell Core, or Command Prompt.

Is this page helpful?

👍 Yes   👎 No