Install and configure Ansible on a control node.

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Introduction

This guide will walk you through installing and configuring Ansible on a Windows system using WSL (Windows Subsystem for Linux). Ansible allows you to manage remote machines, automate tasks, and deploy applications across multiple servers, making infrastructure management simpler and more efficient.

Problem Statement

Setting up Ansible on a Windows system can be challenging due to its native Linux-based environment. This document explains how to install and configure Ansible on Windows using WSL, allowing Windows users to utilize Ansible's automation capabilities seamlessly.

Prerequisites

Software Required

- **Windows 10 or later**
- **Windows Subsystem for Linux (WSL)**
- **Python 3.8 or later**
- **Ansible 2.9 or later**

Hardware Requirement

- **4 GB RAM** or higher
- **20 GB** of free disk space
- **Internet access** for downloading packages

Implementation Steps

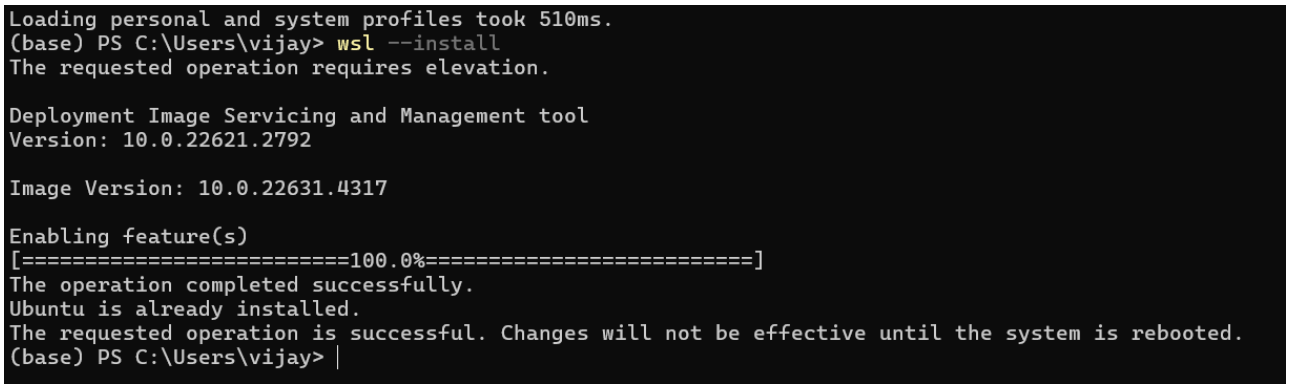
Step-1: Install Windows Subsystem for Linux (WSL)

To run Ansible on a Windows machine, you need to install WSL to provide a Linux environment. Follow the steps below to enable and set up WSL.

1. **Enable WSL**

```
wsl --install
```

Once WSL is installed, restart your Windows system.



2. **Install Linux Distribution**

Install Ubuntu as your Linux distribution:

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

> **Note**: During the setup, you will be asked to create a username and password for your WSL environment.

```
(base) PS C:\WINDOWS\system32> wsl --install -d Ubuntu
Ubuntu is already 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 username.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username: root
fatal: The user `root' already exists.
Enter new UNIX username: user1
New password:
Retype new password:
passwd: password updated successfully
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 5.15.153.1-microsoft-standard-WSL2 x86_64)

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

 System information as of Sat Oct 19 05:49:36 UTC 2024

  System load:  0.04               Processes:             52
  Usage of /:   0.1% of 1006.85GB  Users logged in:       0
  Memory usage: 5%                 IPv4 address for eth0: 172.18.131.152
  Swap usage:   0%
user1@Swayaan:~$
```

3. **Update Linux Packages**

   After setting up Ubuntu, update and upgrade the packages:

   ```
   sudo apt update
   sudo apt upgrade
   ```

```
user1@Swayaan:~$ sudo apt update
[sudo] password for user1:
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [431 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [92.6 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7176 B]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [5788 B]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [553 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [147 kB]
Get:12 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [51.9 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 [388 kB]
Get:15 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [74.8 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 [10.9 kB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [2808 B]
Get:19 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:20 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [344 B]
Get:21 http://archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:22 http://archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:23 http://archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:24 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:25 http://archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:26 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:27 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:28 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [597 kB]
Get:29 http://archive.ubuntu.com/ubuntu noble-updates/main Translation-en [146 kB]
Get:30 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [114 kB]
Get:31 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [10.2 kB]
Get:32 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [705 kB]
Get:33 http://archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [209 kB]
Get:34 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [306 kB]
Get:35 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [19.8 kB]
Get:36 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [388 kB]
```

```
user1@Swayaan:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages will be upgraded:
  binutils binutils-common binutils-x86-64-linux-gnu cloud-init gcc-14-base gtk-update-icon-cache libbinutils
  libctf-nobfd0 libctf0 libegl-mesa0 libgbm1 libgcc-s1 libgl1-mesa-dri libglapi-mesa libglx-mesa0 libgprofng0
  libgtk-3-0t64 libgtk-3-bin libgtk-3-common libproc2-0 libsframe1 libstdc++6 login mesa-vulkan-drivers nano passwd
  procps python3-update-manager snapd update-manager-core vim vim-common vim-runtime vim-tiny xxd
35 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
17 standard LTS security updates
Need to get 71.8 MB of archives.
After this operation, 2038 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 login amd64 1:4.13+dfsg1-4ubuntu3.2 [202 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gcc-14-base amd64 14.2.0-4ubuntu2~24.04 [50.8 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libstdc++6 amd64 14.2.0-4ubuntu2~24.04 [791 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libgcc-s1 amd64 14.2.0-4ubuntu2~24.04 [78.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 passwd amd64 1:4.13+dfsg1-4ubuntu3.2 [845 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libproc2-0 amd64 2:4.0.4-4ubuntu3.2 [59.5 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 procps amd64 2:4.0.4-4ubuntu3.2 [707 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 vim amd64 2:9.1.0016-1ubuntu7.3 [1880 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 vim-common all 2:9.1.0016-1ubuntu7.3 [385 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 vim-tiny amd64 2:9.1.0016-1ubuntu7.3 [803 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 vim-runtime all 2:9.1.0016-1ubuntu7.3 [7281 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 xxd amd64 2:9.1.0016-1ubuntu7.3 [63.1 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 nano amd64 7.2-2ubuntu0.1 [282 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 python3-update-manager all 1:24.04.9 [43.1 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 update-manager-core all 1:24.04.9 [11.6 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libctf-nobfd0 amd64 2.42-4ubuntu2.3 [97.1 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libgprofng0 amd64 2.42-4ubuntu2.3 [849 kB]
Get:18 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libctf0 amd64 2.42-4ubuntu2.3 [94.5 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 binutils-x86-64-linux-gnu amd64 2.42-4ubuntu2.3 [2463 k
B]
```

Step-2: Install Python and PIP

Ansible requires Python to function, so you need to install both Python and PIP on your WSL environment.

1. Install Python:

```
sudo apt install python3
```

```
user1@Swayaan:~$ sudo apt install python3
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3 is already the newest version (3.12.3-0ubuntu2).
python3 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

2. Install PIP:

```
sudo apt install python3-pip
```

```
user1@Swayaan:~$ sudo apt install python3-pip
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  build-essential 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
  javascript-common 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 libexpat1-dev
  libfakeroot libfile-fcntllock-perl libgcc-13-dev libgd3 libgomp1 libheif-plugin-aomdec libheif-plugin-aomenc
  libheif-plugin-libde265 libheif1 libhwasan0 libisl23 libitm1 libjs-jquery libjs-sphinxdoc libjs-underscore liblsan0
  libmpc3 libpython3-dev libpython3.12-dev libquadmath0 libstdc++-13-dev libtsan2 libubsan1 libxpm4 linux-libc-dev
  lto-disabled-list make manpages-dev python3-dev python3-wheel python3.12-dev rpcsvc-proto zlib1g-dev
Suggested packages:
  bzip2-doc cpp-doc gcc-13-locales cpp-13-doc debian-keyring g++-multilib g++-13-multilib gcc-13-doc gcc-multilib
  autoconf automake libtool flex bison gdb gcc-doc gcc-13-multilib gdb-x86-64-linux-gnu apache2 | lighttpd | httpd
  glibc-doc bzr libgd-tools libheif-plugin-x265 libheif-plugin-ffmpegdec libheif-plugin-jpegdec libheif-plugin-jpegenc
  libheif-plugin-j2kdec libheif-plugin-j2kenc libheif-plugin-rav1e libheif-plugin-svtenc libstdc++-13-doc make-doc
The following NEW packages will be installed:
  build-essential 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
  javascript-common 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 libexpat1-dev
  libfakeroot libfile-fcntllock-perl libgcc-13-dev libgd3 libgomp1 libheif-plugin-aomdec libheif-plugin-aomenc
  libheif-plugin-libde265 libheif1 libhwasan0 libisl23 libitm1 libjs-jquery libjs-sphinxdoc libjs-underscore liblsan0
  libmpc3 libpython3-dev libpython3.12-dev libquadmath0 libstdc++-13-dev libtsan2 libubsan1 libxpm4 linux-libc-dev
  lto-disabled-list make manpages-dev python3-dev python3-pip python3-wheel python3.12-dev rpcsvc-proto zlib1g-dev
0 upgraded, 66 newly installed, 0 to remove and 0 not upgraded.
Need to get 82.1 MB of archives.
After this operation, 302 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

3. Verify installation:

```
python3 --version
pip3 --version
```

```
user1@Swayaan:~$ python3 --version
Python 3.12.3
user1@Swayaan:~$ pip3 --version
pip 24.0 from /usr/lib/python3/dist-packages/pip (python 3.12)
user1@Swayaan:~$
```

Step-3: Install Ansible

After setting up Python, you can install Ansible using the following commands.

1. Add the Ansible repository:

```
sudo apt-add-repository --yes --update ppa:ansible/ansible
```

```
user1@Swayaan:~$ sudo apt-add-repository --yes --update ppa:ansible/ansible
Repository: 'Types: deb
URIs: https://ppa.launchpadcontent.net/ansible/ansible/ubuntu/
Suites: noble
Components: main
'
Description:
Ansible is a radically simple IT automation platform that makes your applications and systems easier to deploy. Avoid wr
iting scripts or custom code to deploy and update your applications— automate in a language that approaches plain Englis
h, using SSH, with no agents to install on remote systems.

http://ansible.com/

If you face any issues while installing Ansible PPA, file an issue here:
https://github.com/ansible-community/ppa/issues
More info: https://launchpad.net/~ansible/+archive/ubuntu/ansible
Adding repository.
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu noble InRelease [17.8 kB]
Hit:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Get:6 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu noble/main amd64 Packages [776 B]
Get:7 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu noble/main Translation-en [472 B]
Fetched 145 kB in 1s (112 kB/s)
Reading package lists... Done
user1@Swayaan:~$
```

2. Install Ansible:

```
sudo apt install ansible
```

```
user1@Swayaan:~$ sudo apt install ansible
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ansible-core python3-jmespath python3-kerberos python3-nacl python3-ntlm-auth python3-packaging python3-paramiko
  python3-requests-ntlm python3-resolvelib python3-winrm python3-xmltodict sshpass
Suggested packages:
  python-nacl-doc python3-gssapi python3-invoke
The following NEW packages will be installed:
  ansible ansible-core python3-jmespath python3-kerberos python3-nacl python3-ntlm-auth python3-packaging
  python3-paramiko python3-requests-ntlm python3-resolvelib python3-winrm python3-xmltodict sshpass
0 upgraded, 13 newly installed, 0 to remove and 0 not upgraded.
Need to get 18.7 MB of archives.
After this operation, 206 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 python3-packaging all 24.0-1 [41.1 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/universe amd64 python3-resolvelib all 1.0.1-1 [25.7 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/main amd64 python3-jmespath all 1.0.1-1 [21.3 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/universe amd64 python3-kerberos amd64 1.1.14-3.1build9 [21.2 kB]
Get:5 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu noble/main amd64 ansible-core all 2.17.5-1ppa~noble [1014
kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/main amd64 python3-nacl amd64 1.5.0-4build1 [57.9 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe amd64 python3-ntlm-auth all 1.5.0-1 [21.3 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/main amd64 python3-paramiko all 2.12.0-2ubuntu4 [137 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble/universe amd64 python3-requests-ntlm all 1.1.0-3 [6308 B]
Get:10 http://archive.ubuntu.com/ubuntu noble/main amd64 python3-xmltodict all 0.13.0-1 [13.4 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/universe amd64 python3-winrm all 0.4.3-2 [31.9 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/universe amd64 sshpass amd64 1.09-1 [11.7 kB]
Get:13 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu noble/main amd64 ansible all 10.5.0-1ppa~noble [17.3 MB]
Fetched 18.7 MB in 4s (4184 kB/s)
```

3. Verify the installation:

```
ansible --version
```

```
user1@Swayaan:~$ ansible --version
ansible [core 2.17.5]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/user1/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /home/user1/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.12.3 (main, Sep 11 2024, 14:17:37) [GCC 13.2.0] (/usr/bin/python3)
  jinja version = 3.1.2
  libyaml = True
```

Step-4: Create a Windows User and Configure WinRM

Before proceeding with Ansible configuration, ensure WinRM is configured on your Windows system for remote management.

1. **Create a new user in Windows**:
   - Username: `ansible_user`
   - Password: `P@ssw0rd`
   - Ensure the account type is set to **Administrator**.

2. **Open PowerShell with Administrator access** and check if WinRM is running. If it is not running, start the service with the following commands:

```
winrm quickconfig
```

3. **Set WinRM configuration**:

   Configure WinRM to allow basic authentication:

```
winrm set winrm/config/service/auth '@{Basic="true"}'
```

Step-5: Configure Ansible

1. **Edit the Ansible Inventory**:

   In your WSL environment, open the Ansible inventory file:

```
sudo nano /etc/ansible/hosts
```

2. **Add Windows host configuration**:

   Add the following configuration to the file, replacing `<ip-address>` with the IP of the Windows machine you want to manage:

```
[windows]
<ip-address>

[windows:vars]
ansible_user=ansible_user
ansible_password=P@ssw0rd
ansible_connection=winrm
ansible_winrm_transport=basic
ansible_winrm_server_cert_validation=ignore
ansible_port=5985
```

```
  GNU nano 7.2                                  /etc/ansible/hosts
## 10.25.1.57


# Ex4: Multiple hosts arranged into groups such as 'Debian' and 'openSUSE':

## [Debian]
## alpha.example.org
## beta.example.org

## [openSUSE]
## green.example.com
## blue.example.com


[windows]
192.168.0.104

[windows:vars]
ansible_user=ansible_user
ansible_password=P@ssw0rd
ansible_connection=winrm
ansible_winrm_transport=basic
ansible_winrm_server_cert_validation=ignore
ansible_port=5985



^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A Set Mark
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo       M-6 Copy
```

Step-6: Test Ansible Installation

1. **Ping remote Windows hosts**:

   Test Ansible to ensure that it can communicate with the Windows host by running:

   ```
   ansible windows -m win_ping
   ```

   ```
   user1@Swayaan:~$ ansible windows -m win_ping
   192.168.0.104 | SUCCESS => {
       "changed": false,
       "ping": "pong"
   }
   user1@Swayaan:~$
   ```

   If successful, you will see a response confirming that the connection is established.

Supported Reference

For more detailed references on Ansible for Windows management, you can refer to:

- Ansible Documentation
- WSL Documentation
- Pywinrm Documentation
