Ansible
A tool for Automation

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Contents

1 Introduction

Ansible is an IT automation tool. It can configure systems, deploy software, and orchestrate more advanced IT tasks such as continuous deployments or zero downtime rolling updates.

Ansible's main goals are simplicity and ease-of-use. It also has a strong focus on security and reliability, featuring a minimum of moving parts, usage of OpenSSH for transport (with other transports and pull modes as alternatives), and a language that is designed around auditability by humans–even those not familiar with the program.

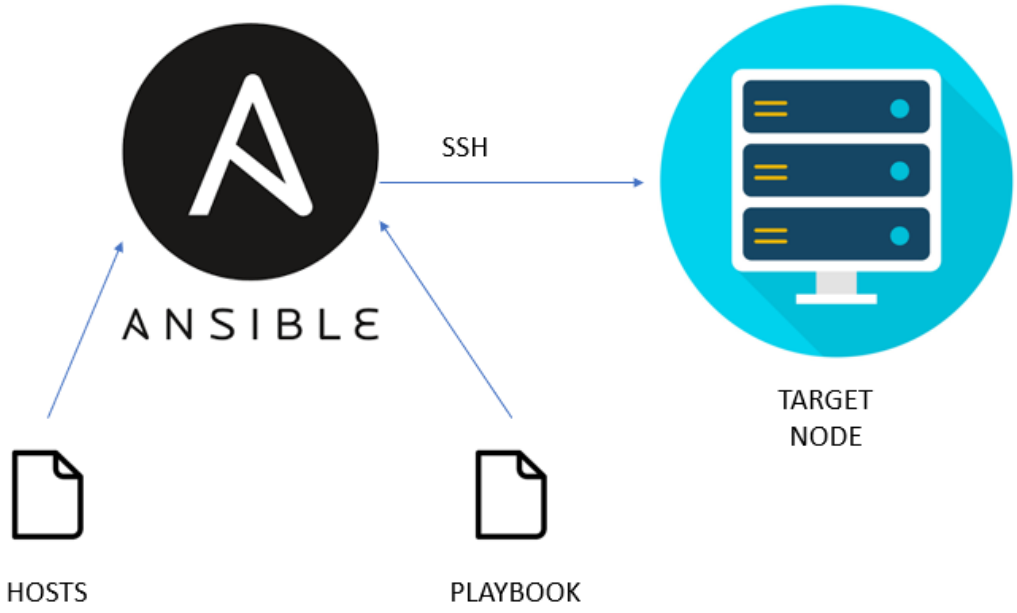


Figure 1: Ansible

2 Ansible Installation

The steps for Ansible installation are as follows:

2.1 Installing Ansible on Ubuntu Machine (linux)

The steps to install ansible on linux are as follows, use the commands in sequential manner for installation.

```
$ sudo apt update
$ sudo apt install software-properties-common
$ sudo add-apt-repository --yes --update ppa:ansible/ansible
$ sudo apt install ansible
```

2.2 Installing Ansible on CentOS Machine

The steps to install ansible on linux are as follows, use the commands in sequential manner for installation.

```
$ sudo yum install epel-release
$ sudo yum install ansible
```

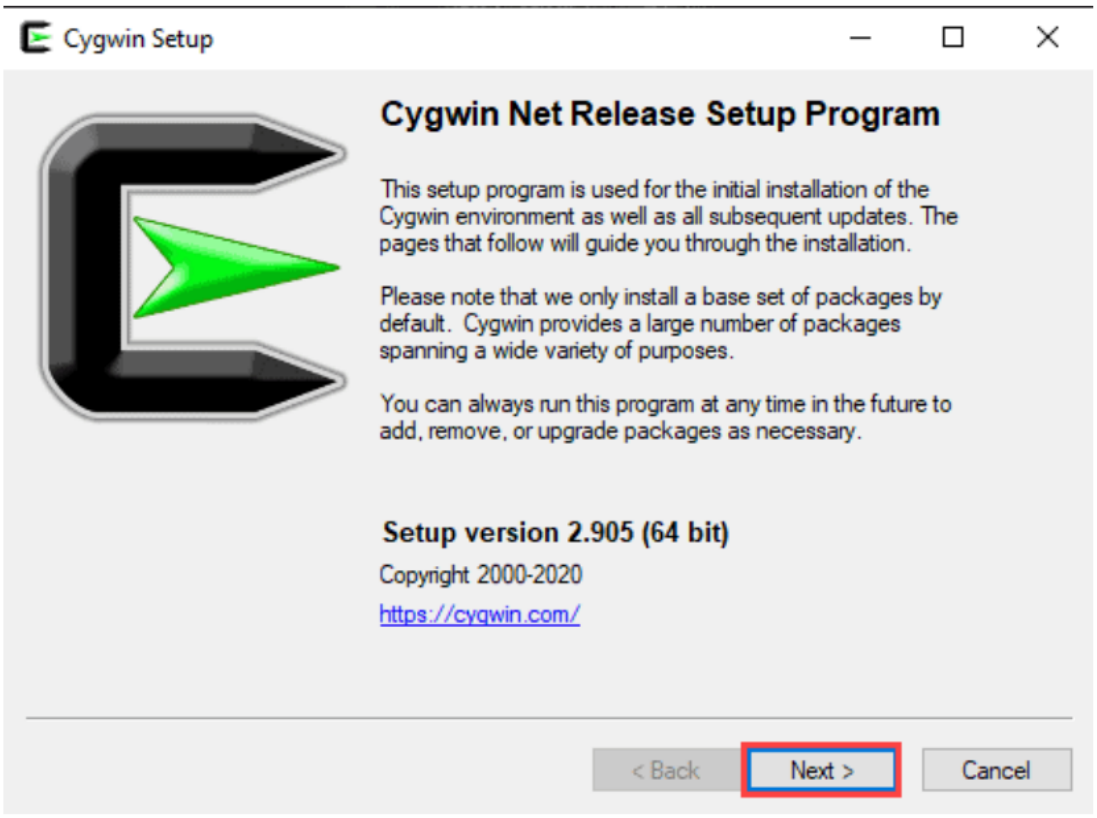
2.3 Installing Ansible on Windows Machine

There are multiple ways of installing ansible on windows, some of them are as follows:

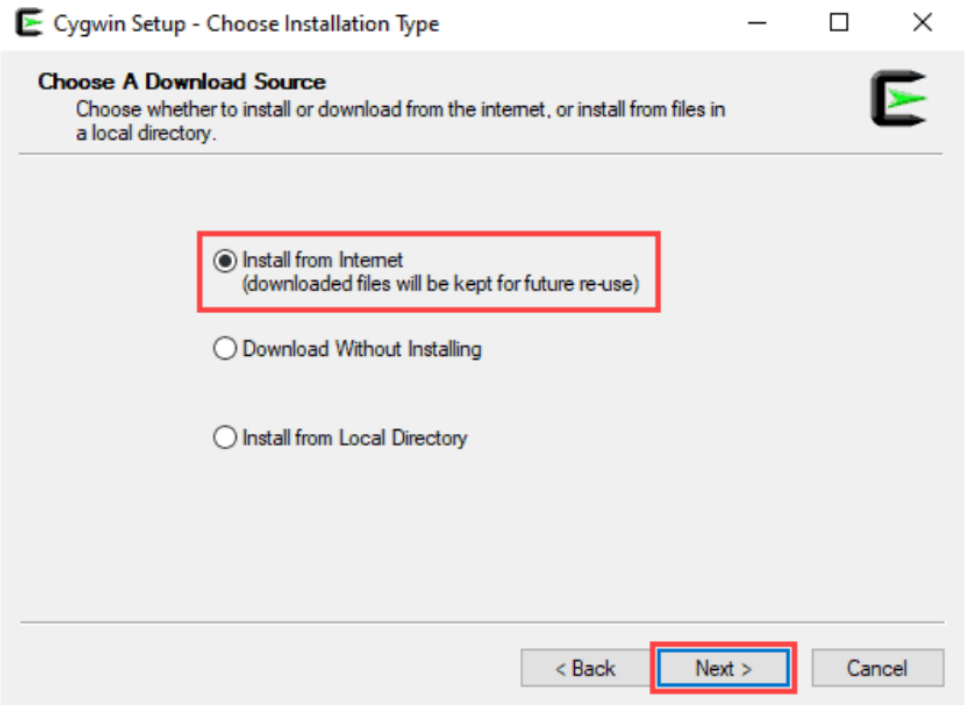
2.3.1 Installing using MinGW on Windows

1. Download the Cygwin installation file. This file is compatible with both the 32-bit and 64-bit versions of Windows 10.

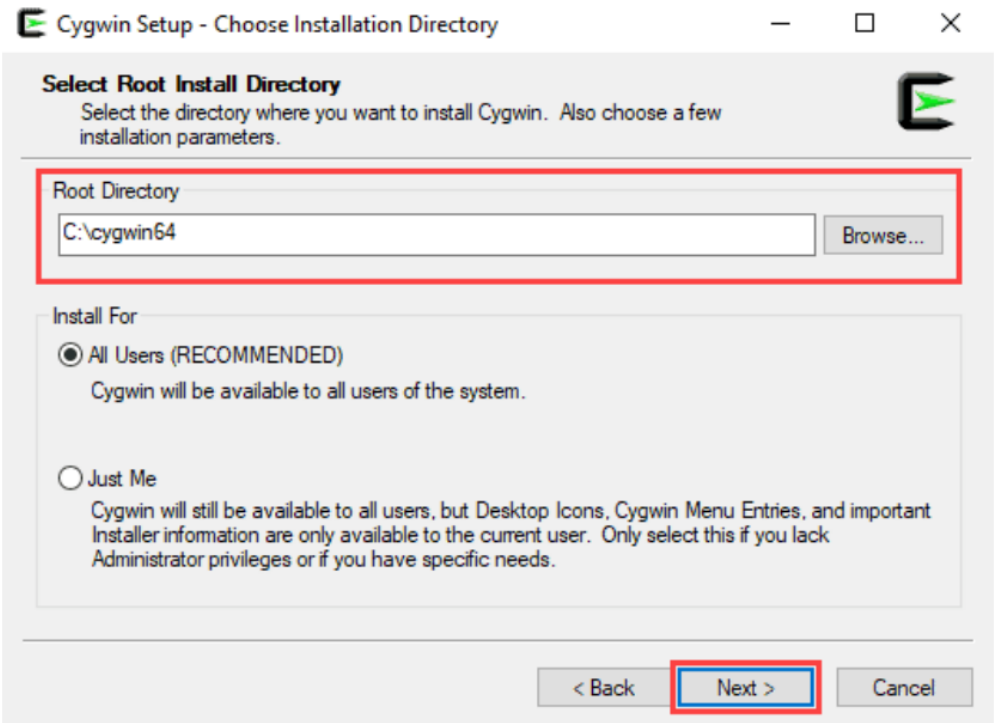
2. Run the Cygwin installation file. On the starting screen of the installation wizard, click Next to continue.



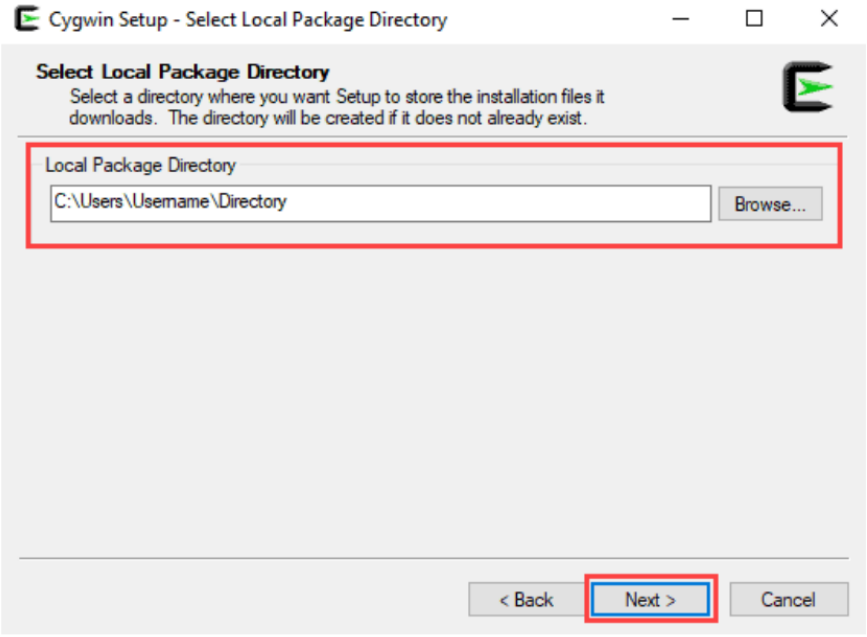
3. Select Install from Internet as the download source and click Next.



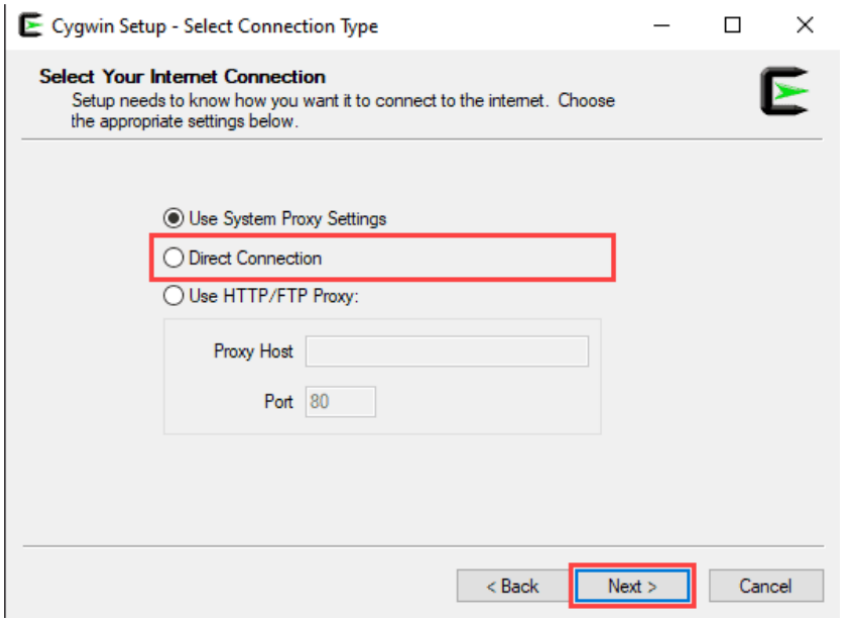
4. In the Root Directory field, specify where you want the application installed, then click Next.



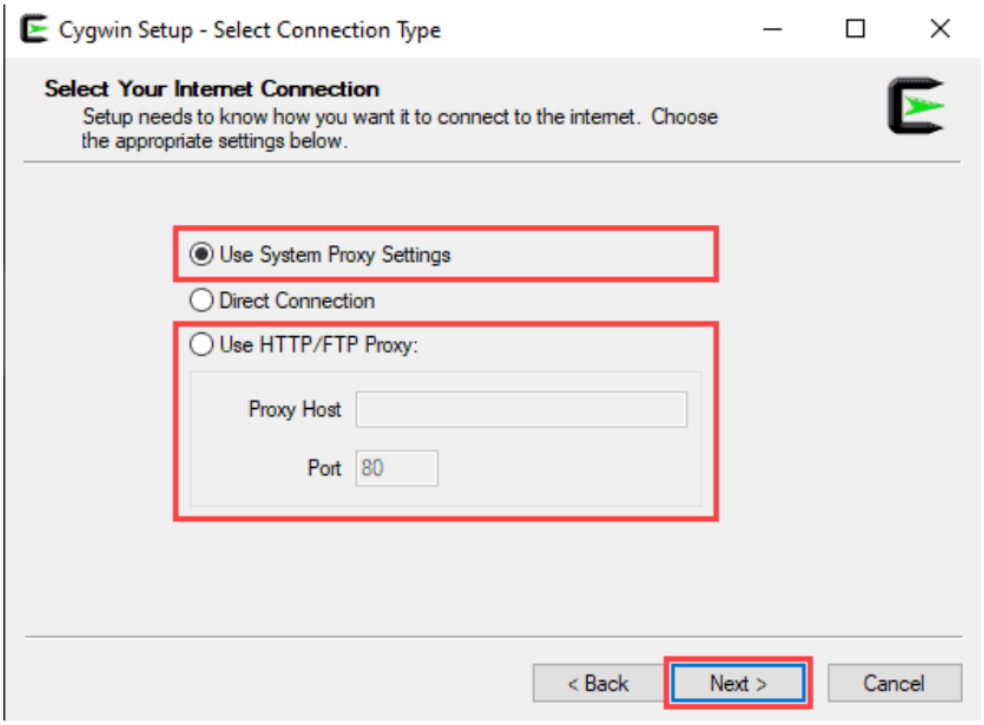
5. In the Local Package Directory field, select where you want to install your Cygwin packages, then click Next.



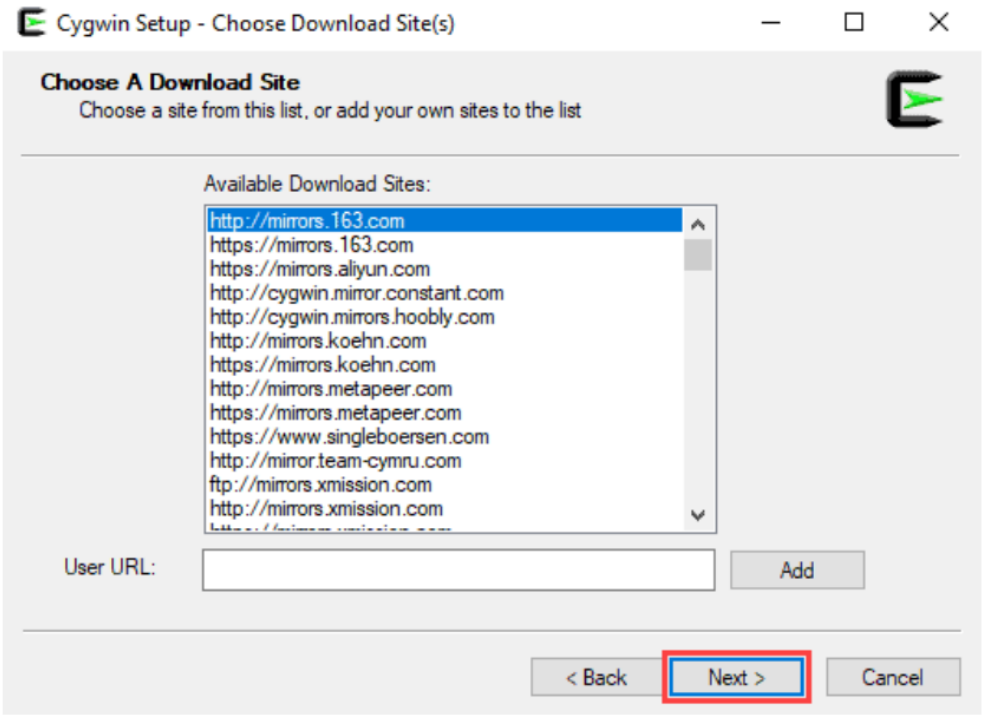
6. Choose the appropriate Internet connection option. If you aren't using a proxy, select Direct Connection.



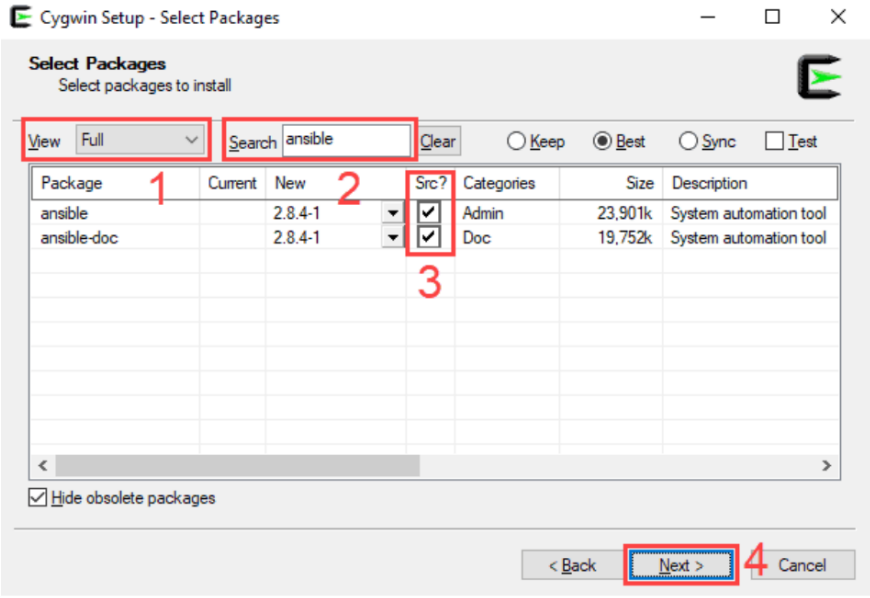
7. If you are using a proxy, select Use System Proxy Settings or enter the proxy settings manually with the Use HTTP/FTP Proxy, and then click Next to continue.



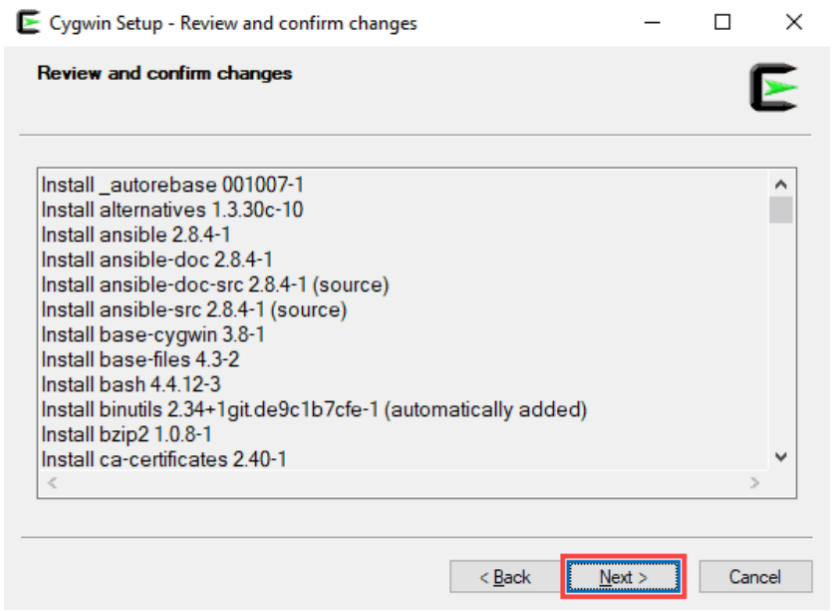
8. Choose one of the available mirrors to download the installation files, then click Next.



9. On the Select Packages screen, change the View option to Full and type ‘ansible’ in the search bar.
   Select both Ansible and Ansible Doc by checking the boxes under Src? and click Next to continue.

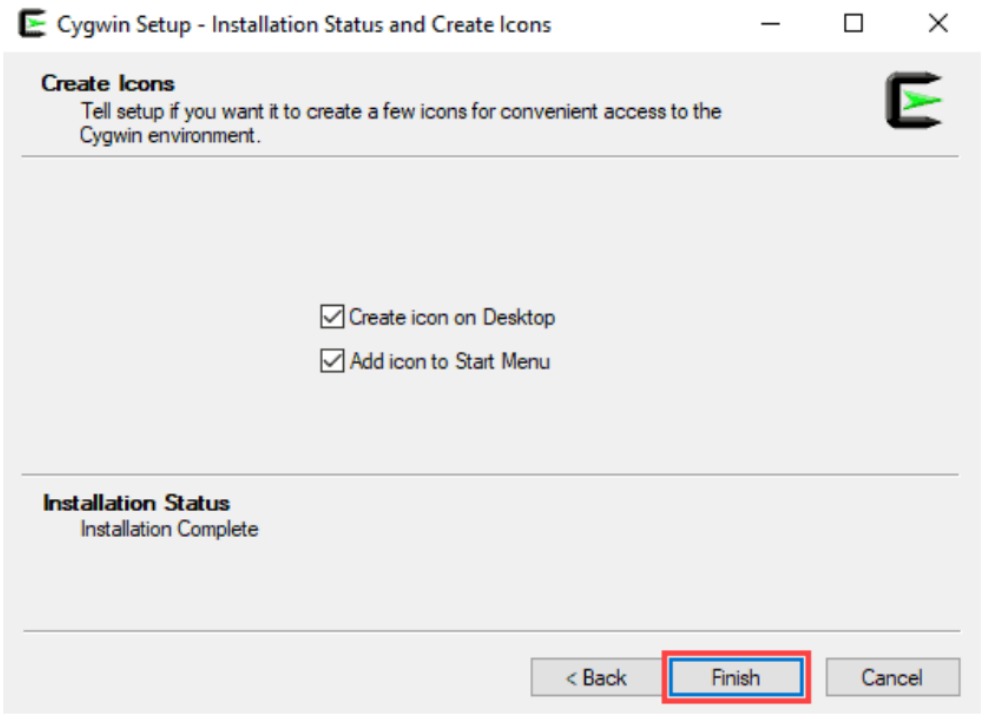


10. This screen lets you review the installation settings. To confirm and begin the install process, click on Next.



11. The install wizard will download and install all the selected packages, including Ansible.
12. Once the installation is complete, select whether you want to add a Cygwin desktop and Start Menu icon, then click on Finish to close the wizard.

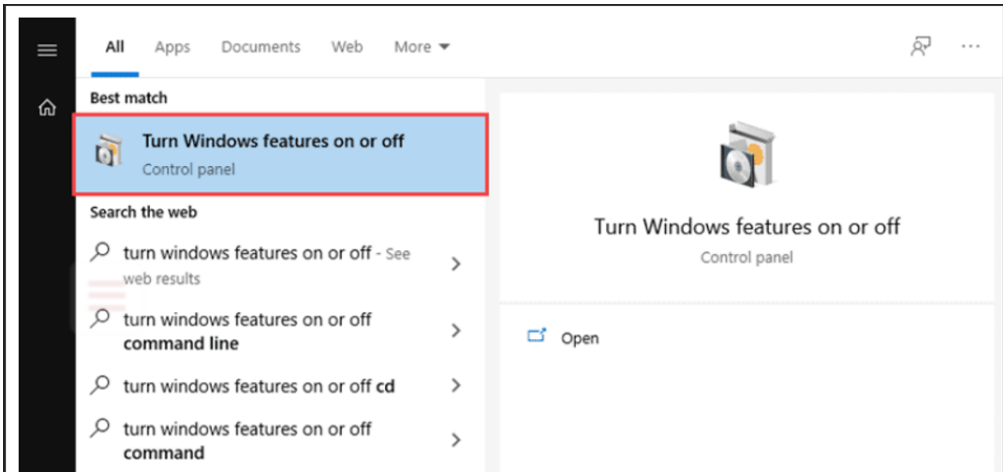
Figure 2: MinGW



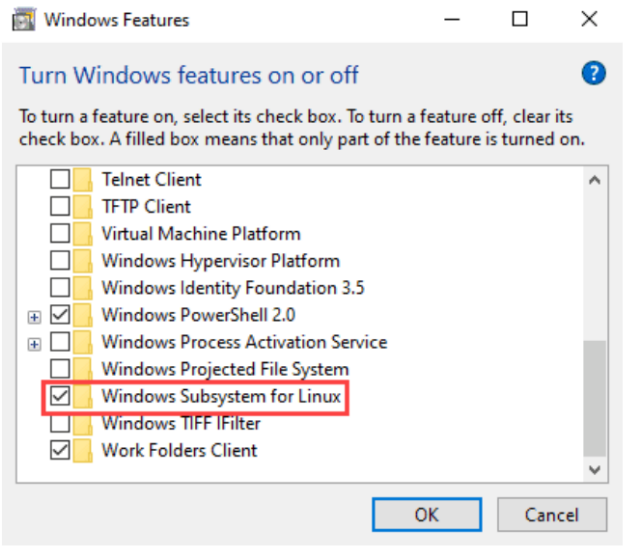
2.3.2 Enabling Ubuntu on Windows 10

Steps to enable WSL on windows are as follows:

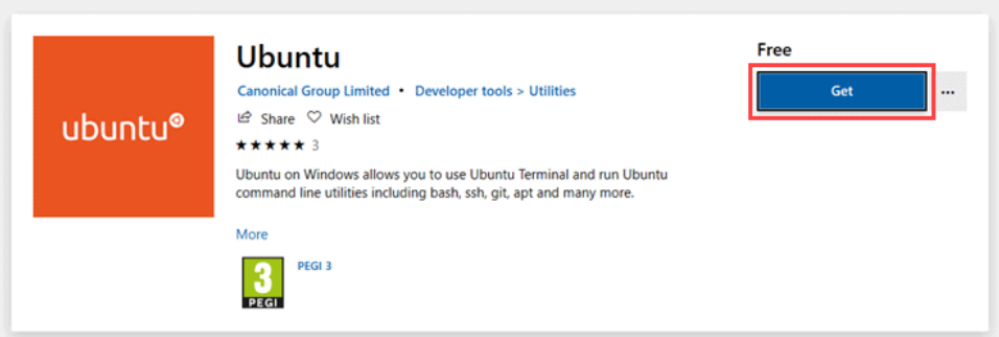
1. 1. Open the Start menu and search for Turn Windows features on or off. Click on the shortcut when it appears.



2. Scroll down through the list of features until you see Windows Subsystem for Linux. Click on the checkbox, and then click OK to enable the feature.



3. Open the Microsoft Store. Search for Ubuntu and click on Get to install the latest version.



4. Once the installation is complete, click on Launch to start up the Ubuntu command terminal.

5. To install Ansible, enter the following set of commands:

```
$ sudo apt update
$ sudo apt install software-properties-common
$ sudo add-apt-repository --yes --update ppa:ansible/ansible
$ sudo apt install ansible
```

3 Ansible Playbook

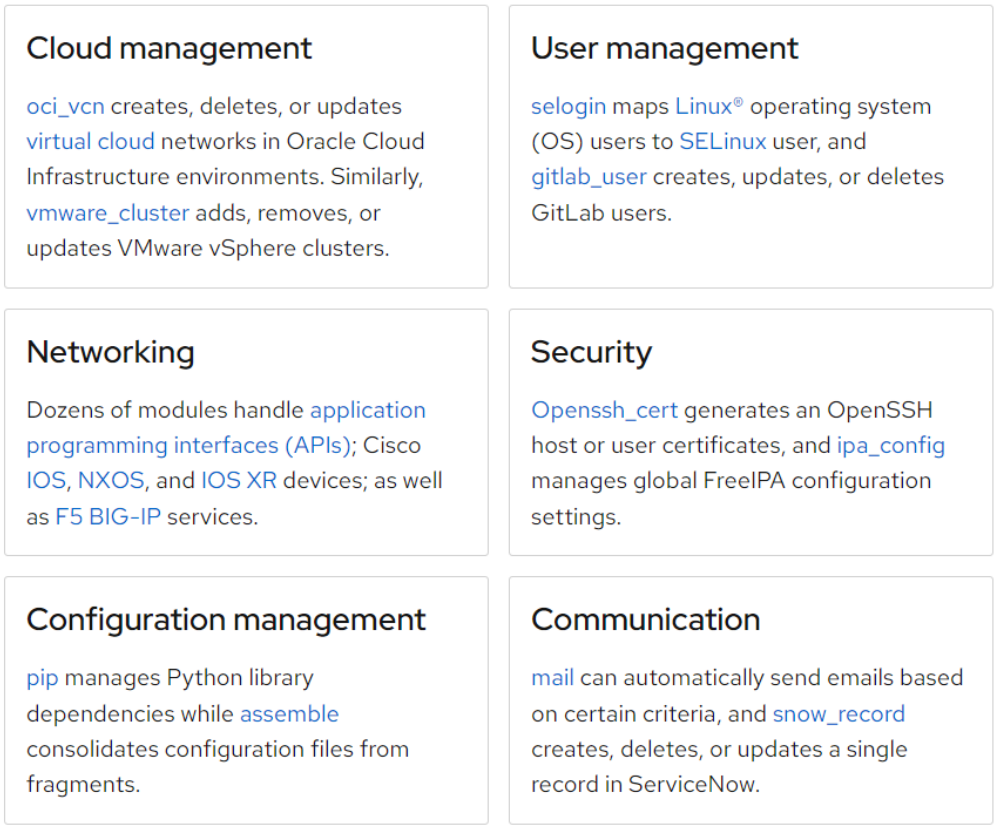
An Ansible® playbook is a blueprint of automation tasks—which are complex IT actions executed with limited or no human involvement. Ansible playbooks are executed on a set, group, or classification of hosts, which together make up an Ansible inventory.

3.1 How do Ansible Playbooks work?

Ansible modules execute tasks. One or more Ansible tasks can be combined to make a play. Two or more plays can be combined to create an Ansible playbook. Ansible playbooks are lists of tasks that automatically execute against hosts. Groups of hosts form your Ansible inventory.

Each module within an Ansible playbook performs a specific task. Each module contains metadata that determines when and where a task is executed, as well as which user executes it.

There are thousands of other Ansible modules that perform all kinds of IT tasks, such as:



3.2 A practical example of an Ansible playbook

Ansible is capable of communicating with many different device classifications, from cloud-based REST APIs, to Linux and Windows systems, networking hardware, and much more. This is a sample of 2 Ansible modules automatically updating 2 types of servers:

```
---

name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

The playbook contains 2 plays:

1. The first checks whether or not web server software is up to date and runs the update if necessary
2. The second checks whether or not database server software is up to date and runs the update if necessary

3.2.1 Installing Custom Packages using Ansible Packages

We can install custom packages using the Ansible Playbooks. Here are the packages that we are going to install

- Neovim
- git
- curl
- vim
- nano
- openssl
- wget
- net-toosl

3.2.2 Writing Playbook for package installation

An Ansible Playbook have a unique of writing a YAML file, when writing an ansible playbook be aware of the syntax. Following code represents installation of apt packages.

```
---

- name: installing req_softwares
  hosts: linux
  become: true
  tasks:
    - name: installing docker vim nano openssl curl wget and git
      apt:
        name: "{{item}}"
        state: latest
        update_cache: yes
      loop:
        - docker.io
        - git
        - vim
        - neovim
        - nano
        - openssl
        - curl
        - wget
        - net-tools
```

3.2.3 Writing Playbook for Docker Compose Installaion

Following is the YAML snippet to install docker compose.

```
---

    - name: installing req_softwares
      hosts: linux
      become: true
      tasks:
          - name: Install docker-compose from official github repo
            get_url:
                url : https://github.com/docker/compose/releases/download
                    /1.29.2/docker-compose-Linux-x86_64
                dest: /usr/local/bin/docker-compose
                mode: 'u+x,g+x'
```