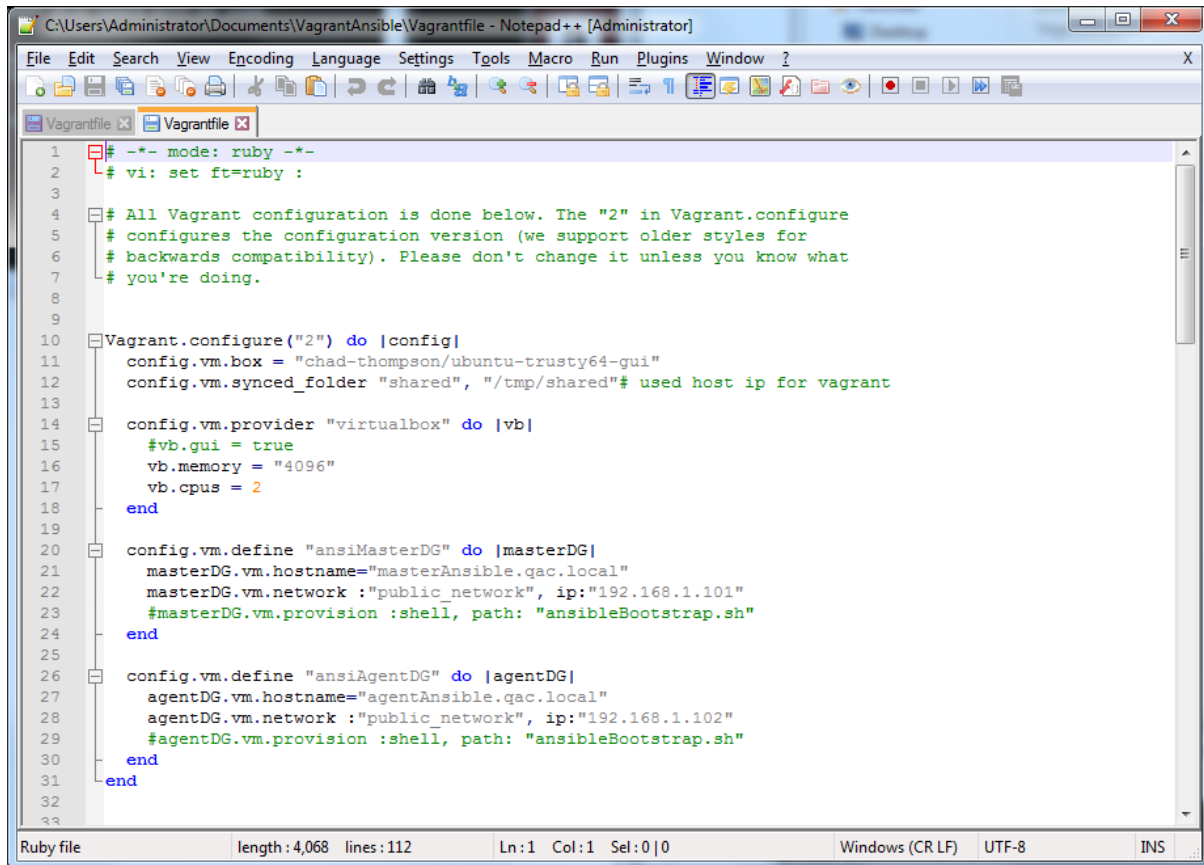


Ansible

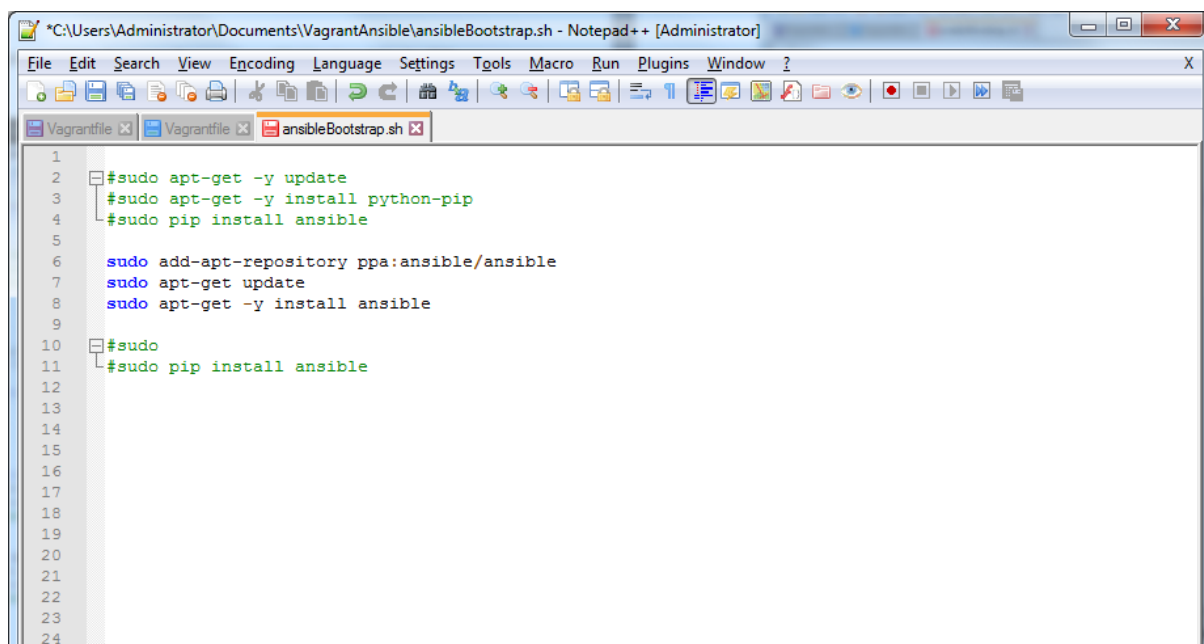
Exercise 1:

Vagrant File for creating & launching two configured virtual machines with mapped shared folder and IP addresses (ansiMasterDG, ansiAgentDG)



```
1 # -*- mode: ruby -*-
2 # vi: set ft=ruby :
3
4 # All Vagrant configuration is done below. The "2" in Vagrant.configure
5 # configures the configuration version (we support older styles for
6 # backwards compatibility). Please don't change it unless you know what
7 # you're doing.
8
9
10 Vagrant.configure("2") do |config|
11   config.vm.box = "chad-thompson/ubuntu-trusty64-gui"
12   config.vm.synced_folder "shared", "/tmp/shared" # used host ip for vagrant
13
14   config.vm.provider "virtualbox" do |vb|
15     #vb.gui = true
16     vb.memory = "4096"
17     vb.cpus = 2
18   end
19
20   config.vm.define "ansiMasterDG" do |masterDG|
21     masterDG.vm.hostname="masterAnsible.qac.local"
22     masterDG.vm.network : "public_network", ip:"192.168.1.101"
23     #masterDG.vm.provision :shell, path: "ansibleBootstrap.sh"
24   end
25
26   config.vm.define "ansiAgentDG" do |agentDG|
27     agentDG.vm.hostname="agentAnsible.qac.local"
28     agentDG.vm.network : "public_network", ip:"192.168.1.102"
29     #agentDG.vm.provision :shell, path: "ansibleBootstrap.sh"
30   end
31 end
32
33
```

Bootstrap File (ansibleBootstrap.sh) for installing ansible for both virtual machines



```
1
2 #sudo apt-get -y update
3 #sudo apt-get -y install python-pip
4 #sudo pip install ansible
5
6 sudo add-apt-repository ppa:ansible/ansible
7 sudo apt-get update
8 sudo apt-get -y install ansible
9
10 #sudo
11 #sudo pip install ansible
12
13
14
15
16
17
18
19
20
21
22
23
24
```

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SSH into both virtual machines via Git Bash and installing Ansible

```
$ vagrant ssh ansiMasterDG
```

```
$ vagrant ssh ansiAgentDG
```

```
vagrant@masteransible: ~  
in the  
ansiAgentDG: virtual machine match the version of VirtualBox you have instal  
led on  
ansiAgentDG: your host and reload your VM.  
ansiAgentDG: Guest Additions Version: 4.3.14  
ansiAgentDG: VirtualBox Version: 5.1  
==> ansiAgentDG: Setting hostname...  
==> ansiAgentDG: Configuring and enabling network interfaces...  
==> ansiAgentDG: Mounting shared folders...  
ansiAgentDG: /vagrant => C:/Users/Administrator/Documents/VagrantAnsible  
ansiAgentDG: /tmp/shared => C:/Users/Administrator/Documents/VagrantAnsible/  
shared  
  
Administrator@MIS MINGW64 ~/Documents/VagrantAnsible (master)  
$ vagrant ssh ansiMasterDG  
Welcome to Ubuntu 14.04 LTS (GNU/Linux 3.13.0-24-generic x86_64)  
  
 * Documentation:  https://help.ubuntu.com/  
  
New release '16.04.2 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
^[[Avagrant@masteransible:~$
```

```
vagrant@masteransible: ~  
Unpacking python-paramiko (1.10.1-1git1build1) ...  
Preparing to unpack .../python-pkg-resources_3.3-1ubuntu2_all.deb ...  
Unpacking python-pkg-resources (3.3-1ubuntu2) over (3.3-1ubuntu1) ...  
Selecting previously unselected package python-setuptools.  
Preparing to unpack .../python-setuptools_3.3-1ubuntu2_all.deb ...  
Unpacking python-setuptools (3.3-1ubuntu2) ...  
Selecting previously unselected package sshpass.  
Preparing to unpack .../sshpas_1.05-1_amd64.deb ...  
Unpacking sshpass (1.05-1) ...  
Selecting previously unselected package ansible.  
Preparing to unpack .../ansible_2.3.0.0-1ppa~trusty_all.deb ...  
Unpacking ansible (2.3.0.0-1ppa~trusty) ...  
Processing triggers for man-db (2.6.7.1-1) ...  
Setting up libyaml-0-2:amd64 (0.1.4-3ubuntu3.1) ...  
Setting up python-markupsafe (0.18-1build2) ...  
Setting up python-jinja2 (2.7.2-2) ...  
Setting up python-yaml (3.10-4ubuntu0.1) ...  
Setting up python-paramiko (1.10.1-1git1build1) ...  
Setting up python-pkg-resources (3.3-1ubuntu2) ...  
Setting up python-setuptools (3.3-1ubuntu2) ...  
Setting up sshpass (1.05-1) ...  
Setting up ansible (2.3.0.0-1ppa~trusty) ...  
Processing triggers for libc-bin (2.19-0ubuntu6) ...  
vagrant@masteransible:~$ vagrant|
```

Confirmation - Ansible installed on virtual machine) via Terminal (ansiMasterDG)

```
vagrant@masteransible:~$ ansible --version  
ansible 2.3.0.0  
  config file = /etc/ansible/ansible.cfg  
  configured module search path = Default w/o overrides  
  python version = 2.7.6 (default, Mar 22 2014, 22:59:56) [GCC 4.8.2]  
vagrant@masteransible:~$ |
```

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Confirmation - Ansible installed on virtual machine) via Terminal (ansiAgentDG)

```
vagrant@agentansible:~$ ansible --version
ansible 2.3.0.0
  config file = /etc/ansible/ansible.cfg
  configured module search path = Default w/o overrides
  python version = 2.7.6 (default, Mar 22 2014, 22:59:56) [GCC 4.8.2]
```

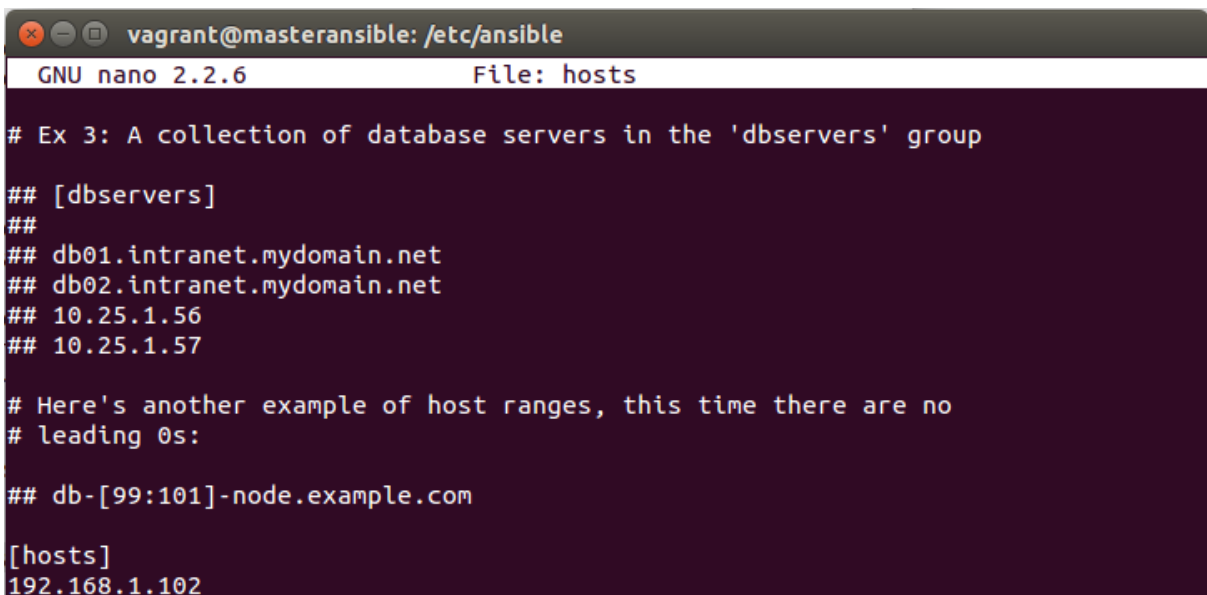
Exercise 2:

Navigating to correct file directory :

/etc/ansible/hosts.

```
vagrant@masteransible:/etc/ansible$ nano hosts
```

Creating 'hosts' group and Adding IP Agent machine Nano file editor



```
vagrant@masteransible: /etc/ansible
GNU nano 2.2.6      File: hosts

# Ex 3: A collection of database servers in the 'dbservers' group

## [dbservers]
##
## db01.intranet.mydomain.net
## db02.intranet.mydomain.net
## 10.25.1.56
## 10.25.1.57

# Here's another example of host ranges, this time there are no
# leading 0s:

## db-[99:101]-node.example.com

[hosts]
192.168.1.102
```

Creating an SSH Key so that Ansible can access/ping the host machine

Commands used:

```
$ ssh-keygen -t rsa
```

```
$ ssh-agent bash
```

```
$ ssh-add ~/.ssh/id_rsa
```

```
$ ssh-copy-id vagrant@192.168.1.102
```

Test from Master that connection was successful

#Command executed from Master VM

```
$ ansible all -i hosts -u vagrant -m setup
```

```
vagrant@masteransible:/etc/ansible$ ansible all -i hosts -u vagrant -m setup
192.168.1.102 | SUCCESS => {
  "ansible_facts": {
    "ansible_all_ipv4_addresses": [
      "10.0.2.15",
      "192.168.1.102"
    ],
    "ansible_all_ipv6_addresses": [
      "fe80::a00:27ff:fe79:dbe"
    ],
    "ansible_apparmor": {
```

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Successful ping of all hosts from ansible

Showing successful connection to host

ansible all -m ping

```
vagrant@masteransible:~$ ansible all -m ping
Enter passphrase for key '/home/vagrant/.ssh/id_rsa':
192.168.1.102 | SUCCESS => {
  "changed": false,
  "ping": "pong"
}
```

Java & Maven Installed Successfully

```
vagrant@masteransible:/etc/ansible$ sudo nano playbookn_java_maven.yml
vagrant@masteransible:/etc/ansible$ ansible-playbook -i hosts playbookn_java_maven.yml
[DEPRECATION WARNING]: Instead of sudo/sudo_user, use become/become_user and make sure
become_method is 'sudo' (default).
This feature will be removed in a future release. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.

PLAY [install_java_maven] *****

TASK [Gathering Facts] *****
ok: [192.168.1.102]

TASK [install_java] *****
ok: [192.168.1.102]

TASK [install_maven] *****
ok: [192.168.1.102]

PLAY RECAP *****
192.168.1.102      : ok=3    changed=0    unreachable=0    failed=0
```

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Problem Encountered:

Error connecting to host machine, IP from host machine changed and issues with SSH connection using linked public and private keys

Solution (Steps Involved):

Reconfiguring IP Addresses for both the Master & Agent machines:
Configure for Wireless connection 2 (NAT/Bridged Connections)

Set Broadcast Address as default Gateway

Editing Wired connection 2

Connection name: Wired connection 2

General Ethernet 802.1x Security IPv4 Settings IPv6 Settings

Method: Manual

Addresses

| Address | Netmask | Gateway | |
|---------------|---------------|-------------|--------|
| 192.168.1.101 | 255.255.255.0 | 192.168.1.2 | Add |
| | | | Delete |

DNS servers:

Search domains:

DHCP client ID:

☐ Require IPv4 addressing for this connection to complete

Routes...

Cancel Save...

Edit Connection Properties (Wired Connection 2)

Network Connections

| Name | Last Used |
|--------------------|----------------|
| ▼ Ethernet | |
| Wired connection 1 | now |
| Wired connection 2 | 3 minutes ago |
| Wired connection 2 | 11 minutes ago |

Add Edit... Delete...

Close

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'Ifconfig' to check that correct Ip addresses have set correctly to both Virtual Machines

```
vagrant@masteransible: /etc/ansible
RX packets:15485 errors:0 dropped:0 overruns:0 frame:0
TX packets:4771 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:15818776 (15.8 MB) TX bytes:453731 (453.7 KB)

eth1    Link encap:Ethernet HWaddr 08:00:27:b3:5d:4d
        inet addr:192.168.1.101 Bcast:192.168.1.255 Mask:255.255.255.0
        inet6 addr: fe80::a00:27ff:feb3:5d4d/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
        RX packets:3254 errors:0 dropped:0 overruns:0 frame:0
        TX packets:1337 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:409292 (409.2 KB) TX bytes:934452 (934.4 KB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1 Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING MTU:65536 Metric:1
        RX packets:218 errors:0 dropped:0 overruns:0 frame:0
        TX packets:218 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:0
        RX bytes:19507 (19.5 KB) TX bytes:19507 (19.5 KB)

vagrant@masteransible:/etc/ansible$
```

```
vagrant@agentansible: ~
RX packets:10371 errors:0 dropped:0 overruns:0 frame:0
TX packets:3495 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:10540541 (10.5 MB) TX bytes:343266 (343.2 KB)

eth1    Link encap:Ethernet HWaddr 08:00:27:f1:7f:3c
        inet addr:192.168.1.102 Bcast:192.168.1.255 Mask:255.255.255.0
        inet6 addr: fe80::a00:27ff:fef1:7f3c/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
        RX packets:1091 errors:0 dropped:0 overruns:0 frame:0
        TX packets:259 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:144193 (144.1 KB) TX bytes:40749 (40.7 KB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1 Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING MTU:65536 Metric:1
        RX packets:336 errors:0 dropped:0 overruns:0 frame:0
        TX packets:336 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:0
        RX bytes:27898 (27.8 KB) TX bytes:27898 (27.8 KB)

vagrant@agentansible:~$
```

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Enter root mode:

#Command:

sudo su root

```
root@masteransible:/etc/ansible# sudo su root
```

Running Command in root to add & recreate the SSH Key

\$ ssh-keygen -t rsa

\$ ssh-agent bash

\$ ssh-add ~/.ssh/id_rsa

\$ ssh-copy-id vagrant@192.168.1.102

type Vagrant password

Running playbook file as root user

```
root@masteransible:/etc/ansible# ansible all -i hosts -u vagrant -m setup
```

Java Installed and configured on Agent VM

```
vagrant@agentansible:~$ java -version
java version "1.8.0_45"
Java(TM) SE Runtime Environment (build 1.8.0_45-b14)
Java HotSpot(TM) 64-Bit Server VM (build 25.45-b02, mixed mode)
```

Maven Installed and configured on Agent VM

```
vagrant@agentansible: ~
vagrant@agentansible:~$ mvn -v
Apache Maven 3.3.9 (bb52d8502b132ec0a5a3f4c09453c07478323dc5; 2015-11-10T10:41:47-06:00)
Maven home: /home/vagrant/Documents/apache-maven-3.3.9
Java version: 1.8.0_45, vendor: Oracle Corporation
Java home: /home/vagrant/Documents/jdk1.8.0_45/jre
Default locale: en_US, platform encoding: UTF-8
OS name: "linux", version: "3.13.0-24-generic", arch: "amd64", family: "unix"
```

Playbook_java_maven.yml

```
root@masteransible: /etc/ansible
GNU nano 2.2.6 File: playbook_java_maven.yml

---
- name: install_java_maven
  hosts: all
  remote_user: vagrant
  sudo: yes

  tasks:
    - name: install_java
      unarchive:
        src: /tmp/shared/java.tar.gz
        dest: /home/vagrant/Documents
        copy: no

    - name: install_maven
      unarchive:
        src: /tmp/shared/maven.tar.gz
        dest: /home/vagrant/Documents
        copy: no

    - name: creating_configlink
      command: "[[ item ]]"
      with_items:
        - "update-alternatives --install /usr/bin/java java /home/vagrant/Documents/jdk1.8.0_45/bin/java 100"
        - "update-alternatives --install /usr/bin/javac javac /home/vagrant/Documents/jdk1.8.0_45/bin/java 100"
        - "update-alternatives --install /usr/bin/mvn mvn /home/vagrant/Documents/apache-maven-3.3.9/bin/mvn 100"

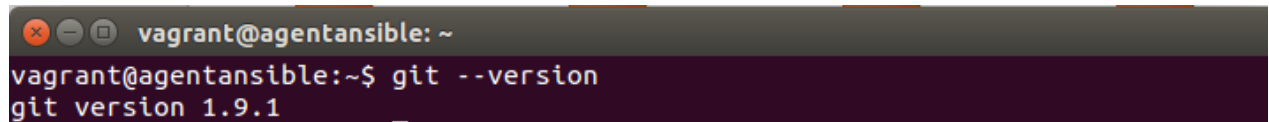
Read 26 lines
^G Get Help      ^O WriteOut      ^R Read File      ^V Prev Page      ^K Cut Text      ^C Cur Pos
^X Exit          ^J Justify        ^W Where Is       ^N Next Page      ^U UnCut Text    ^T To Spell
```


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Git Installed on Agent VM:

Install present version of git using advanced packaging tool

```
- name: install_git
  apt: name=git state=present
```



A terminal window with a dark background. The prompt is 'vagrant@agentansible: ~'. The command 'git --version' has been entered, and the output is 'git version 1.9.1'.

Jenkins Installed on Agent VM:

Approach 1:

Downloading package from remote server using apt-get and installing from remote location.

Disadvantage:

If this applied to many machines it would slow down the automation process since it would need to be downloaded Jenkins remotely each time to install on every machine without using the local install file (jenkins_2.1_all.deb).

This approach would not be practical and efficient with more than one machines

```
- name: creating configlink
  command: "{{ item }}"
  with_items:
  - "apt-get install -y -f"
  - "apt-get install -y jenkins"
  - "service jenkins start"
```

Approach 2:

Using locally stored package to deploy Jenkins on default port (80:80). Idempotent approach used to prevent the same process being repeated multiple times i.e. in this case packages will not be installed twice if the package already exists, only the updated changes are processed.

```
- name: install_jenkins
  apt: deb="/tmp/shared/jenkins_2.1_all.deb" state=present force=yes

- name: run_jenkins
  service: name=jenkins state=started enabled=yes
```

Jenkins running on port 80:80

localhost:8080



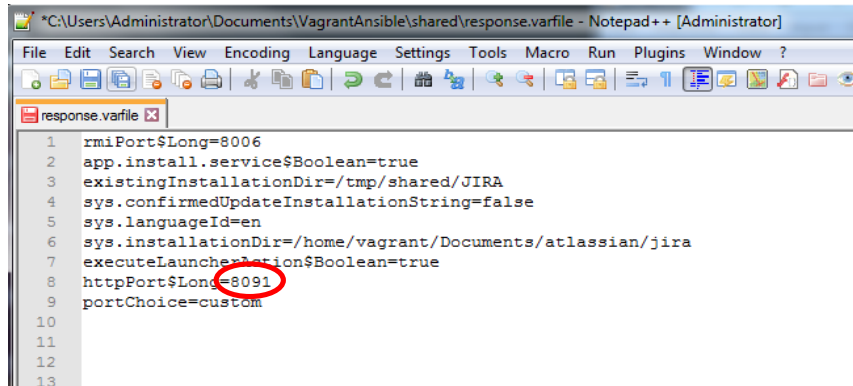
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Jira Installed on Agent VM:

File Name: response.varfile

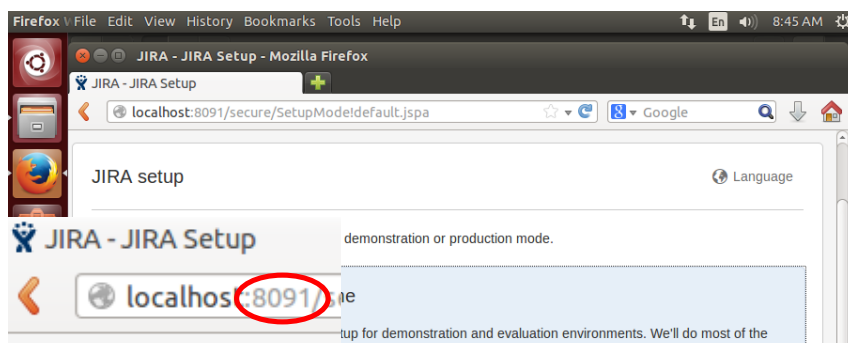
varfile for mapping the configuration settings for Jira during Installing.

Port set to run on 8091



```
*C:\Users\Administrator\Documents\VagrantAnsible\shared\response.varfile - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
response.varfile
1 rmiPort$Long=8006
2 app.install.service$Boolean=true
3 existingInstallationDir=/tmp/shared/JIRA
4 sys.confirmedUpdateInstallationString=false
5 sys.languageId=en
6 sys.installationDir=/home/vagrant/Documents/atlassian/jira
7 executeLauncher$Boolean=true
8 httpPort$Long=8091
9 portChoice=custom
10
11
12
13
```

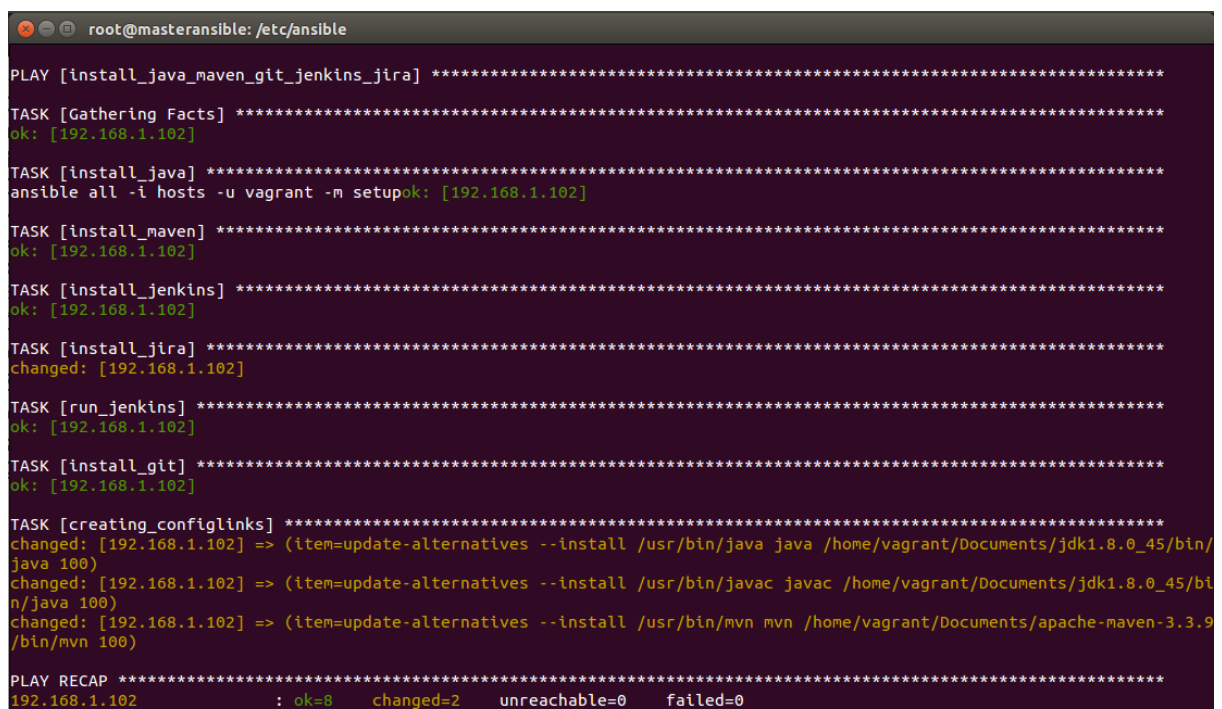
```
- name: install_jira
  command: "/tmp/shared/jira.bin -q -varfile response.varfile"
```



Installed Application [Java, Maven, Git, Jenkins and Jira]

#Running Playbook File

\$ ansible-playbook -i hosts playbookn_java_maven.yml



```
root@masteransible: /etc/ansible

PLAY [install_java_maven_git_jenkins_jira] *****

TASK [Gathering Facts] *****
ok: [192.168.1.102]

TASK [install_java] *****
ansible all -i hosts -u vagrant -n setupok: [192.168.1.102]

TASK [install_maven] *****
ok: [192.168.1.102]

TASK [install_jenkins] *****
ok: [192.168.1.102]

TASK [install_jira] *****
changed: [192.168.1.102]

TASK [run_jenkins] *****
ok: [192.168.1.102]

TASK [install_git] *****
ok: [192.168.1.102]

TASK [creating_configlinks] *****
changed: [192.168.1.102] => (item=update-alternatives --install /usr/bin/java java /home/vagrant/Documents/jdk1.8.0_45/bin/java 100)
changed: [192.168.1.102] => (item=update-alternatives --install /usr/bin/javac javac /home/vagrant/Documents/jdk1.8.0_45/bin/javac 100)
changed: [192.168.1.102] => (item=update-alternatives --install /usr/bin/mvn mvn /home/vagrant/Documents/apache-maven-3.3.9/bin/mvn 100)

PLAY RECAP *****
192.168.1.102 : ok=8 changed=2 unreachable=0 failed=0
```