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Intro to ansible
Setting up ansible on virtualbox or linux or cloud
Introduction yaml
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Playbooks
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What is ansible:
Ansible maintain by redhat and developed by using python language.

Ansible is an open-source software provisioning, configuration management, and application-deployment tool enabling infrastructure as code. It runs on many Unix-like systems, and can configure both Unix-like systems as well as Microsoft Windows.
Ansible is an push based mechanism.
Ansible we can write yaml files.

Reference pdf: http://people.redhat.com/mskinner/rhug/q2.2017/Ansible-Hands-on-Introduction.pdf
https://docs.ansible.com/ansible/latest/index.html

Setup Ansible (installation Ubuntu)

Take 2 servers one is ansible master other one is ansible slave (i am taking 2 ubuntu servers)
Launch servers.
ref:https://docs.ansible.com/ansible/latest/installation_guide/intro_installation.html#installing-ansible-on-ubuntu
sudo apt-get update -y
sudo apt install software-properties-common
sudo apt-add-repository --yes --update ppa:ansible/ansible
sudo apt install ansible

To check python version --- python3 --version
ansible --version (for ansible shows the version)
from above steps the ansible configuration is done.
Now we have to make ssh connection between the node and server.
vi /etc/hosts
private ip address server1.com server1
Private ip address node1.com node1
Do the same operations in both server and node.
After going to aws console check server and node actions click on reboot.
cd .ssh
ssh-keygen (it will generate keys)
before generate ssh-keygen go to
vi /etc/ssh/sshd_config
----------continued----------

In this file
Permit root login will be yes &
PasswordAuthentication yes
systemctl restart sshd (its used for the restart a ssh)
Now in the position of .ssh type ssh-keygen
ls now u wil see the public key and private key
vi public key (copy that one)

Login into node server;

cd .ssh
vi authorized_keys
To go for end of ssh file type shift +a
Paste the public key of ansible server in node..
Save the file.
In node go
vi /etc/ssh/sshd_config
In this file
Permit root login will be yes &
PasswordAuthentication yes
systemctl restart sshd (its used for the restart a ssh)
After ssh restart on node go to main server console.
and sudo su
ssh give here node server ip address.

type yes
Now it will login on node server.
----------for this succesfully we made ssh connection between server to node----------
Master server inventory containn all the ip address of nodes.
cd /etc/ansible/
vi hosts
[webserver]
172.31.38.220 (its is a private ip address of node like how many nodes present give step by step)

ansible -m ping all
Sample will be like this:

172.31.38.220 | SUCCESS => {
"ansible_facts": {
"discovered_interpreter_python": "/usr/libexec/platform-python"
},
"changed": false,
"ping": "pong"
}

Ansible ON RHEL & CENTOS

sudo su && cd
pwd(now u r in root directory to install softwares)
yum install wget (its for download web packages in linux)
yum info wget (info command used to know complete information about that package)
cat /etc/redhat-release (to find version of redhat)
rpm -Uvh https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm (its for Upgrade package we downloaded that epel repo)
yum install epel-release -y --- its for downloading the epel package in our linux machine
yum install python (ansible develop by python so we need python if python not available means we will go with python 3)
If python not install means it will give suggestions like this below
There are following alternatives for "python": python2, python36, python38
Now we go with python3.
yum install git python3 python3-pip ansible openssl -y --- using this command we at a time installing the python and ansible)
Now it will download all the packeges.
To check python version --- python3 --version
ansible --version (for ansible shows the version)

vi /etc/hosts
private ip address server1.com server1
Private ip address node1.com node1
Do the same operations in both server and node.
After going to aws console check server and node actions click on reboot.
cd .ssh
ssh-keygen (it will generate keys)
before generate ssh-keygen go to
vi /etc/ssh/sshd_config
In this file
Permit root login will be yes &
PasswordAuthentication yes
systemctl restart sshd (its used for the restart a ssh)
Now in the position of .ssh type ssh-keygen
Is now u wil see the public key and private key
vi public key (copy that one)

Login into node server;

cd .ssh
vi authorized_keys
To go for end of ssh file type shift +a
Paste the public key of ansible server in node..
Save the file.
In node go
vi /etc/ssh/sshd_config
In this file
Permit root login will be yes &
PasswordAuthentication yes
systemctl restart sshd (its used for the restart a ssh)
After ssh restart on node go to main server console.
and sudo su
ssh give here node server ip address.

type yes
Now it will login on node server.
----------for this succesfully we made ssh connection between server to node----------
Master server inventory contains all the ip address of nodes.
cd /etc/ansible/
vi hosts
[web server]
172.31.38.220 (its is a private ip address of node like how many nodes present give step by step)

ansible -m ping all
Sample will be like this:

```
172.31.38.220 | SUCCESS => {
"ansible_facts": {
"discovered_interpreter_python": "/usr/libexec/platform-python"
},
"changed": false,
"ping": "pong"
}
```

----------from above we are successfully learned ansible installation on ubuntu && rhel----------

Ansible Inventory

ssh nodepublicipadddress (it wll ask yes make it yes)
mkdir test
cd test
cat > inventory.txt
target1 ansible_host=172.31.5.130 (if password is there) ansible_ssh_pass=mypassword
Ctrl +c to save the file
ansible target1 -m ping -i inventory.txt
We will see message like this:

```
target1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
```

**note if we have multiple nodes we can put in inventory file and we run
ansible target2 -m ping -i inventory.txt (now it will through error bcoz
ssh target1 ipaddress already we enable ssh using yes or no option but target2 ip we did not made any ssh connect for that solving issues we have 2 solutions 1. Make ssh 2ndtagetipaddress (allow yes) or -->

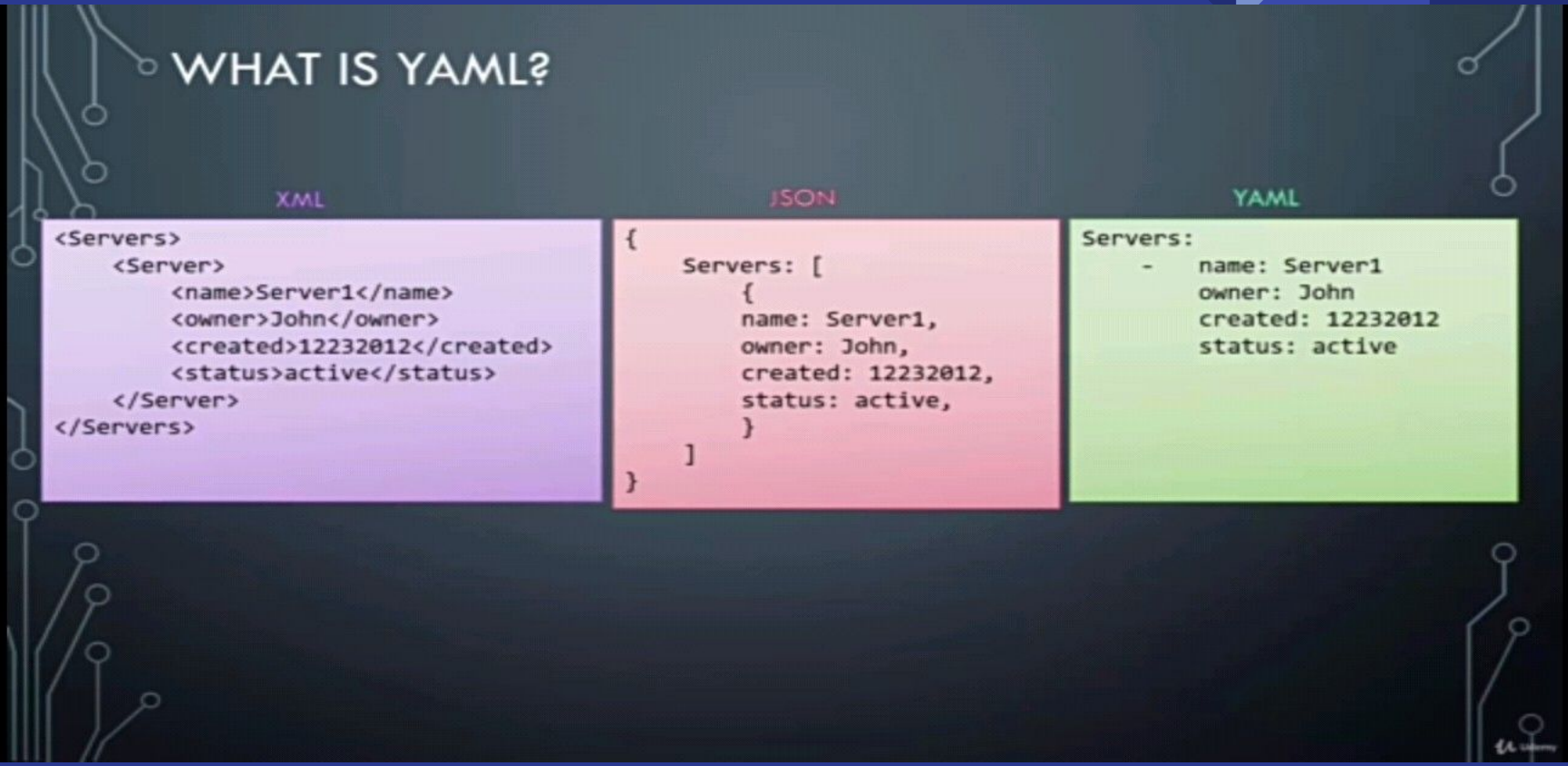
2 nd solution go to default ansible inventory path change settings.
path: vi /etc/ansible/ansible.cfg
/host_key (search for it) press enter
U will find #host_key_checking = False
Just remove # and save the file.

Now u try with target u will saw that success message.
ansible target1 -m ping -i inventory.txt

Below fill with theory of ansible inventory.

YAML

In ansible playbooks we can build by using yaml
Ansible playbooks are textfiles or configuration files are written in a particular format called yaml



Reference url: https://kodekloud.com/p/ansible-practice-test/?scenario=questions_yaml

Sample Yaml Files:

1)
```yaml
employee:
  name: john
  gender: male
  age: 24
  address:
    city: edison
    state: 'new jersey'
    country: 'united states'
```

2)
```yaml
employees:
  -
    name: john
    gender: male
    age: 24
  -
    name: sarah
    gender: female
    age: 28
```

List of Dictionary in Dictionary

Now try adding the pay information. Remember while `address` is a dictionary, `payslips` is an array of `month` and `amount`

Key/Property	Value
name	john
gender	male
age	24
address	...
payslips	

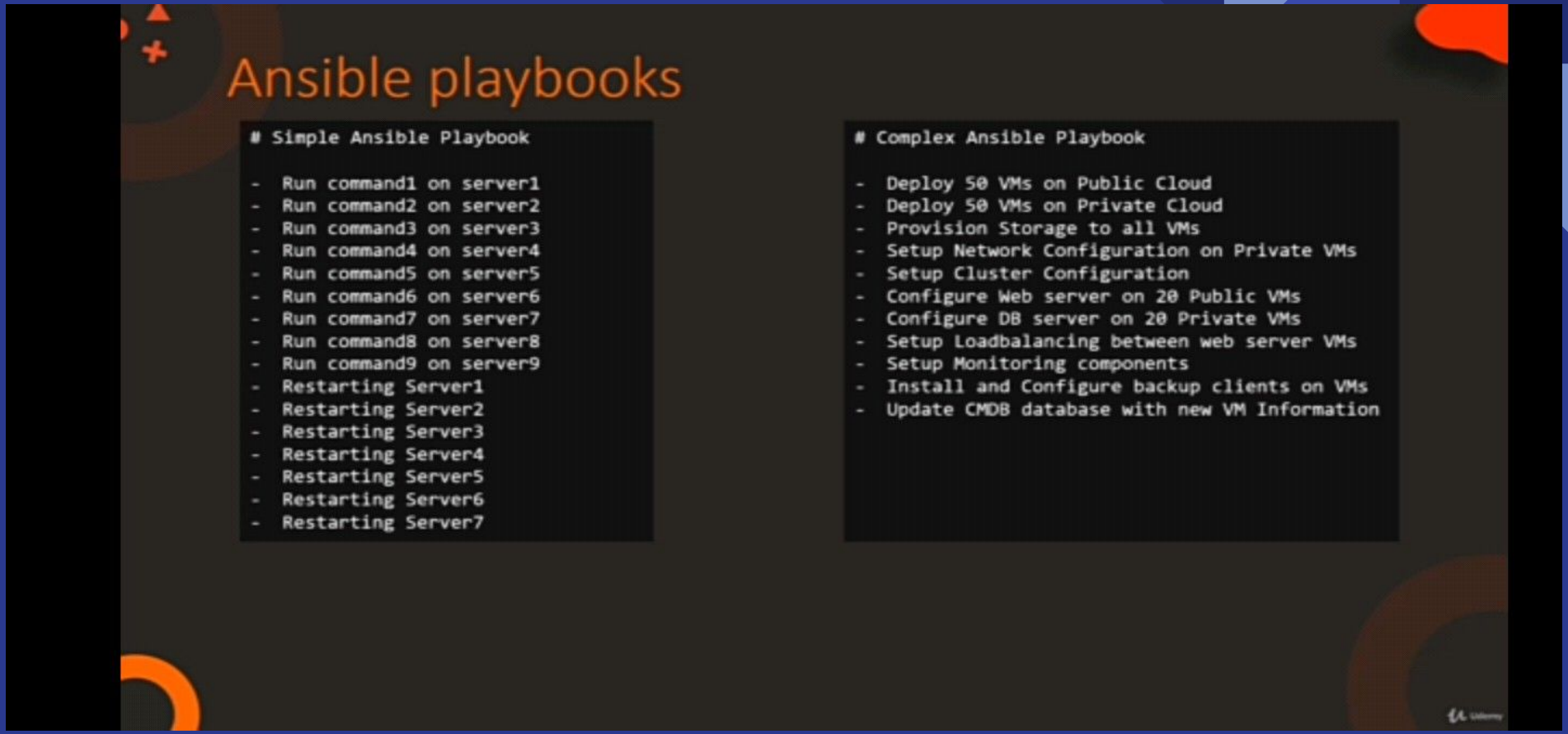
#	month	amount
1	june	1400
2	july	2400
3	august	3400

Above Image Answer:

```
employee:
    name: john
    gender: male
    age: 24
    address:
        city: edison
        state: 'new jersey'
        country: 'united states'
    payslips:
        -
            month: june
            amount: 1400
        -
            month: july
            amount: 2400
        -
            month: august
            amount: 3400
```

Ansible PlayBooks

In playbook we can give what we want to do



Playbook is a single yaml file (playbook.yaml)
Play Defines set of activities.
Task to be run on hosts
Task - An action to be performed on the host
→ execute a command
→ Run a script
→ Install a package
→ shutdown/restart

Sample playbook:

```
---
- hosts: webserver
  remote_user: root
  become: yes
  tasks:
    - name: install httpd
      yum: name=httpd state=installed
    - name: copy index.html file
      copy: src=index.html dest=/var/www/html
    - name: restart service
      service: name=httpd state=started
```

Running Ansible Playbook Commands

RUN

ansible

```
ansible <hosts> -a <command>
ansible all -a “/sbin/reboot”
ansible <hosts> -m <module>
ansible target1 -m ping
```

ansible-playbook

```
ansible-playbook <playbook name>
ansible-playbook playbook-webserver.yaml
```

cd test (inventory project exist on in this folder)
ansible -m ping all - i inventory.txt

It will ping all host which are present in our server
Or else u want add direct default all hosts follow below procedure
cd /etc/ansible/
vi hosts
[webserver]
172.31.38.220 (its is a private ip address of node like how many nodes present give step by step)
ansible -m ping all
172.31.38.220 | SUCCESS => {
"ansible_facts": {
"discovered_interpreter_python": "/usr/libexec/platform-python"
},
"changed": false,
"ping": "pong"
}

Like this it will display all records..

Now in this same folder create one sample file
Create
sample.yml

vi sample.yml

```
-
    name: Test connectivity to target servers
    hosts: all
    tasks:
      - name:  ping test
        ping:
```

Save and exit

To run ansible playbooks follow below command:
ansible-playbook sample.yml(playbookname) -i inventory.txt

Tips and Tricks of while Developing ansible playbooks

Develop playbooks using free tool ATOM IDE

Need to research on work from windows when we push that folder willl be there in server need to focus if we required or comfortable with notepad++ or any other tool.

Practise: ansible playbooks.
Reference url: https://kodekloud.com/p/ansible-practice-test/?scenario=questions_ansible_playbook

Important ansible palybook yaml commands

```
-
  name: 'Stop the web services on web server nodes'
  hosts: web_nodes
  tasks:
    -
      name: 'Stop the web services on web server nodes'
      command: 'service httpd stop'
-
  name: 'Shutdown the database services on db server nodes'
  hosts: db_nodes
  tasks:
    -
      name: 'Shutdown the database services on db server nodes'
      command: 'service mysql stop'
-
  name: 'Restart all servers (web and db) at once'
  hosts: all_nodes
  tasks:
    -
      name: 'Restart all servers (web and db) at once'
      command: '/sbin/shutdown -r'
-
  name: 'Start the database services on db server nodes'
  hosts: db_nodes
  tasks:
    -
      name: 'Start the database services on db server nodes'
      command: 'service mysql start'
-
  name: 'Start the web services on web server nodes'
  hosts: web_nodes
  tasks:
    -
      name: 'Start the web services on web server nodes'
      command: 'service httpd start'
```

Ansible Modules

Command module:

It used to execute a command on remote node

Ex: referenceurl: https://kodekloud.com/p/ansible-practice-test/?scenario=questions_ansible_modules

```
-
  name: plat1
  hosts: any
  tasks:
     - name: executing date
       command: date

    - name: display content
       command: cat /etc/sample.php
```

Script command used to execute the script in remote server

Service Command: start,stop,Restart

```
-
  name: plat1
  hosts: any
  tasks:
    - name: executing date
      service: name=postgresql state=started (similar name place httpd,nginx we use to start web services state=started
```

Variables:
Its used to store the information.

```
---
- hosts: webserver
  remote_user: root
  become: yes
  vars:
   pkg: httpd
  tasks:
   - name: install httpd
     yum: name={{pkg}} state=installed
   - name: creates index.html file
     copy: src=index.html dest=/var/www/html
   - name: restart httpd
     service: name={{pkg}} state=started
```

Save

Ansible files:

Previously we store variables inside a playbook but now we are storing variables in a file.

Create fileabc.yml file paste below code on this.

```
pkg: httpd
```

After create files.yml (paste below code)

```
---
- hosts: webserver
  remote_user: root
  become: yes
  vars_files:
   - fileabc.yml
  tasks:
   - name: install httpd
     yum: name={{pkg}} state=installed
   - name: creates index.html file
     copy: src=index.html dest=/var/www/html
   - name: restart httpd
     service: name={{pkg}} state=started
```

Checking syntax:

```
ansible-playbook files.yml --syntax
ansible-playbook files.yml
```

Ansible Handler
It will notify when something is happen
Ex:if any changes is there means we will restart the server otherwise no
vi handler.yml

```
---
- hosts: webserver
  remote_user: root
  become: yes
  tasks:
    - name: install httpd
      yum: name=httpd state=installed
    - name: copy index.html file
      copy: src=index.html dest=/var/www/html
      notify: restart httpd
    - name: restart service
      service: name=httpd state=started
  handlers:
    - name : restart the server
      service: name=httpd state=restarted
```

Note :

Must u have to check the syntax:
ansible-playbook handler.yml --syntax
ansible-playbook handler.yml

Loops playbook ansible

For suppose i want install multi packages in nodes or at a time we install 100 packages at a time.

vi loop.yml

```
---
- hosts: webserver
  remote_user: root
  become: yes
  tasks:
   - name: installing multiple packages
     yum: name={{item}} state=installed
     with_items:
        - httpd
        - curl
        - wget
```

ansible-playbook loop.yml --syntax

Above if we observe withitems place we need to give whatever the packages we need to install.

Ansible Include:

By using this we are including the yaml file or playbooks

```
vi include.yml
---
- hosts: webserver
  remote_user: root
  become: yes
  tasks:
    - include: pavani.yml
    - include: config.yml
    - include: service.yml
```

Register

Register module we used to capture the output

Debug is used to display the output

```
 Vi register.yml
---
- hosts: webserver
  remote_user: root
  become: yes
  tasks:
    - name: install httpd
      yum: name=httpd state=installed
    - name: creates index.html file
      copy: src=index.html dest=/var/www/html
    - name: restart httpd
      service: name=httpd state=started
      register: output
    - debug:
        msg: "{{output}}"

ansible-playbook register.yml --syntax
```

Tags:
In play book if u want perform a particular task for ex i have 3 task i want to run 2 task that time i just give 2 tagname is enough to run that task.
vi tags.yml

```
---
- hosts: webserver
  remote_user: root
  become: yes
  tasks:
   - name: install httpd
     yum: name=httpd state=installed
     tags:
      - install
   - name: creates index.html file
     copy: src=index.html dest=/var/www/html
     tags:
      - configure
   - name: restart httpd
     service: name=httpd state=started
     tags:
      - service
save:
```

Execute below commands:
Method1:
ansible-playbook tags.yml --tag "install,configure"
ansible-playbook tags.yml --skip-tags "install,configure"
Method2:
ansible-playbook tags.yml --start-at-task="creates index.html file"
Method3:
ansible-playbook tags.yml --step (this step ask permission 2 execute)

Ansible Security or vault

```
---
- hosts: webserver
  remote_user: root
  become: yes
  vars:
   password: raj
  tasks:
   - name: install httpd
     yum: name=httpd state=installed
   - name: creates index.html file
     copy: src=index.html dest=/var/www/html
   - name: restart httpd
     service: name=httpd state=started
```

To run this
ansible-vault encrypt vault.yml

Above command will convert the plain text to other diffrent hidden format

It will ask u r playbook password give it 2 times now that file will be encrypted
Now if u type cat password.yml its not in human readable launguage.

ansible-playbook vault.yml --ask-vault-pass

Above command is asked before ur playbook will execute

ansible-vault edit vault.yml (coomand for edit the encrypt file)
ansible-vault rekey vault.yml (we can modify the password)
ansible-vault decrypt vault.yml (we can decrypt the ansible file)

Ignore errors

Create a vi ignore.yml file

Below code i am giving wrong name 4 index.html

```
---
- hosts: webserver
  remote_user: root
  become: yes
  tasks:
    - name: install httpd
      yum: name=httpd state=installed
    - name: copy index.html file
      copy: src=indgjx.html dest=/var/www/html
      Ignore_errors: yes
    - name: restart service
      service: name=httpd state=started
```

Check synax and run

Simple Task implementation with Any Configuration management tools

- ✓ If we go with any automation tools like ansible, chef, puppet, salt or any other then we can complete this simple task in 3 min (which is required per server) for all 100 server.
- ✓ Ansible will execute a task on all servers parallelly. So it will take only 3 min of time for any number of server for our requirement.
- ✓ Generally writing shell script is complex compare to playbooks and playbooks are very short in code length.

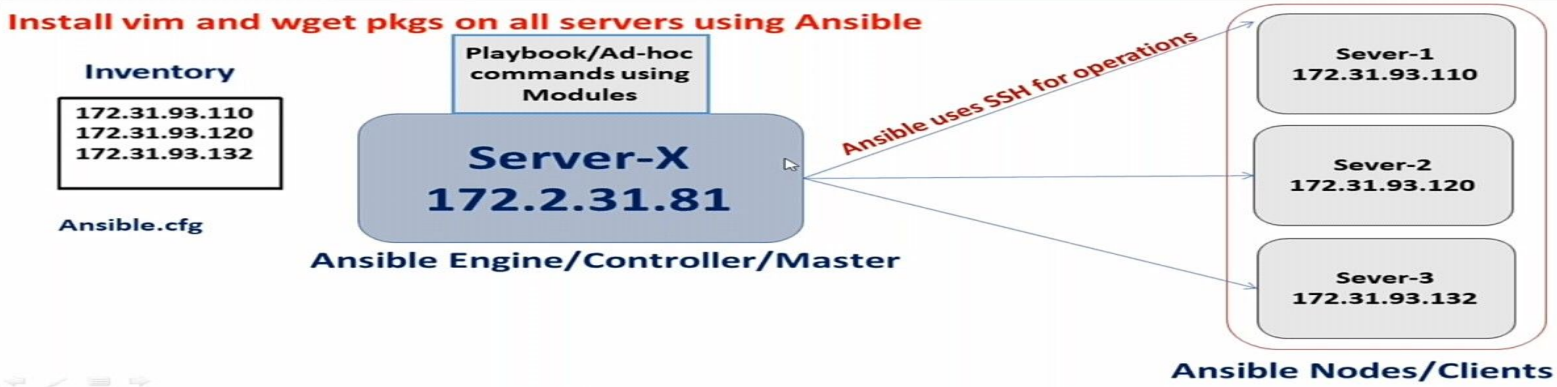
Ansible

Introduction to Ansible

- ✓ Ansible is an open source Automation tool.
- ✓ It is very, very simple to setup and yet powerful.
- ✓ Ansible will be helpful to perform:
  - ✓ Configuration Management
  - ✓ Application Deployment
  - ✓ Task Automation
  - ✓ and also IT orchestration

Ansible

Simple Ansible Architecture



Ansible

Why Ansible ?

- It is a free open source Automation tool and simple
- Using Existing OpenSSH
- Agent-less – No need to install any agent on Ansible Clients/Nodes
- Phython/YAML based
- Highly flexible and configuration management of systems.
- Large number of ready to use modules for system management
- Custom modules can be added if needed

Ansible

Steps: Password less Authentication

- Create same user(ansadmin) across all servers and provide password for all users.
- Provide root privileges to all ansadmin users on all servers.
- Make sure that PasswordAuthentication yes in all servers under /etc/ssh/sshd_config file.
- Generate ssh-keys using ssh-keygen command from ansadmin.
- Copy ssh public key using ssh-copy-id <hostname> from /home/ansadmin/.ssh/ location.
- Now login to remote server without providing password with the following command:
  - ssh user_name@hostname

- Now we can test connection from Ansible Engine to Mange Node using:
  - ansible all -m ping

Real Time password less authentication ansible configuration.

Take 2 aws rhel instances.(`#!/bin/bash`)
Need ansible (if want ansible u need to have python instlled)
yum install wget
rpm -Uvh https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm
yum install epel-release -y
yum install python
yum install git python3 python3-pip ansible openssl -y
python --version
python3 --version
ansible --version
** Now we r going 2 creating a user
useradd ansadmin
[root@ip-172-31-9-112 ~]# passwd ansadmin
Changing password for user ansadmin.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.

Provide same procedure to all ansible nodes
**

**providing root priviliges to ansadmin.
Go to root path and type:
visudo
Go to lastline under ec2-user add your ansadmin user give privilizes
ansadmin   ALL=(ALL)   NOPASSWD: ALL
** go to this path and make password authentication yes
/etc/ssh/sshd_config (in this file under above comment below PasswordAuthentication change no to yes)
To disable tunneled clear text passwords, change to no here!
PasswordAuthentication yes
Save
Restart sshd : systemctl restart sshd

** Generate ssk key gen (this step is only for master node)
Before login to ansadmin user
 su - ansadmin
Check pwd (u were in /home/ansadmin path)
sudo ls -l (u have to use must sudo here)
ssh-keygen
Enter 3 times enter

Before we copy publich ssh key loginto all ur nodes and follow above procedure (install ansible, configure ansible)
Login into node.

Ssh copyid to nodes.
cd .ssh (here we can see plublic ip and private ip)
Go to master node. (paste below command)
ssh-copy-id 172.31.7.66 (nodes private ip address)
Click on yes.
Give your node user password.
Now u r successfully logged in node server.

If you want to check
ssh give urnode publicip or privateip it will directly logged into your server.
Or
ssh ansadmin@ipaddress
Now passwordless authentication done.
Now copy all ur nodes ip address.
**
Now update inventory files with node ips but default inventory file path is
vi /etc/ansible/hosts
Open file top of that paste all node ipaddress.
Save

To check all nodes conectivity.
ansible all -m ping (**important note when run this command you must be in ansadmin user and run coomand)
It will ping all comands (nodes must be python with ansible).

Ansible Directory Structure

Default ansible path:
/etc/ansible.
Here we have 3 files 1-> ansible.cfg 2.roles 3.hosts

In hosts
Paste all node private ips if master also same in aws or master in vmware or etc just use publicip of nodes

Host file is called as inventory file.
**if want change default path of the inventory just go to ansible.cfg under inventory give exact path
If multiple persion are used to work same host file that time conflict will come thats why.
Create our own directory inside of that
mkdir myinventory
cd myinventory
sudo cp -rpP /etc/ansible/* . (it will copy all destination files into our folder)

Here create our host files also.
now ansible.cfg file in inventory line give inventory = ./inventory (new host file name).
Now check ansible all -m ping
Never Don't modify name of ansible.cfg entire ur ansible carrer)
**if we want to run our custom ansible file without configuring ansible.cfg follow below command
ansible all -m ping -i inventory (now it will run directly)

Disable hostkey checking

What is it “ if any time u want to connect to nodes it will ask yes or no in your remote server) it’s asking for confirmation for that we need to disable hostkey checking.

In real time

mkdir non-production

mkdir production

cd non-production

sudo cp -r /etc/ansible/* .

sudo chown -R ansadmin *

Open ansible.cfg inventory give .(current folder)

**2 ways to disable hostkey check

1.export ANSIBLE_HOST_KEY_CHECKING=False

2.ansible.cfg file

host_key_checking = False (make this one true)

Inventory file with groups

If u want to ping all hosts at a time:
ansible all -m ping
If you want ping only oneip that time
ansible iipaddress -m ping
If u want ping two ipaddress.
ansible ip1address:ip2address -m ping

For suppose u have 100 servers but u want to work on 50 servers only i.e we can use group concept
cd non-production
In inventory file or hosts
[webservers] (group name must be written without spaces)
localhost
Ip1
Ip2

[dbservers]
localhost
Ip3
Ip4
To ping or run groups
ansible webservers -m ping (now it will run only group1 ip's)
ansible webservers:dbservers -m ping (now it will run both groups ip's)

Host file group of groups

cd non-production
In inventory file or hosts
[webservers] (group name must be written without spaces)
localhost
Ip1
Ip2

[dbservers]
localhost
Ip3
Ip4

[merginggroup]
Webservers
dbservers

To ping
ansible merginggroup -m ping

ansible.cfg (when u run default first it will call that to priority basis we can see this one below picture)

Ansible

Ansible ansible.cfg

- The default location is: /etc/ansible/ansible.cfg, in which we can make various settings like
  - Location of inventory file
  - host_key_checking as False
- But we can define ansible configuration file in different location and for this there is a priority for this files.
- Locations with priority(starting from top to bottom):
  - ANSIBLE_CONFIG environment variable
  - ./ansible.cfg from the current directory
  - ~/.ansible.cfg file present in home directory
  - /etc/ansible/ansible.cfg default ansible.cfg file.
- Ansible will only use the configuration settings from the file which is found in this sequence first, it will not look for the settings in the higher sequence files if the setting is not present in the file which is chosen for deployment.

Working With Nodes

Two ways :
1.Ad-hoc commands
2.Playbooks

1.Ad-hoc commands

Its useful to execute single task on ur manage nodes
ansible all -m shell -a "uptime" (uptime is a adhoc command)
ansible all -m shell -a "uptime (free-h is a adhoc command)

Push base mechanism practical

ansible all -m shell -a “sleep 5 : echo hai ” (each node print echo after 5 seconds)
ansible-doc -l (will giive the list of all adhoc commands)

Ansible when running it will push a folder to nodes

If u want to check login to node and run above any commands on master .

In node go to user ansadmin here we can see one .ansible
/home/ansadmin/.ansible/tmp/here the folder will come in the format of folder.py
**Default ansible will run 5 servers at a time if u want change . change in ansible.cfg fort=how many u want
Default ansible run parallely (at a time it will execute all nodes)
If u want run sequential go to ansible.cfg and change or made fork = 1 (run comand it will execute one by one)

Adhoc transfer a file from oned server to other
ansible db -m copy -a “src=./hosts dest=/tmp/inventory”
ssh nodeip (check in tmp folder it will create”
** ansible is an idempotentity means anychanges made before transter then only it will transfer it exists previous one it wont transfer
ansible db -m copy -a “content=’hello transfer a file’ dest=/tmp/hello.txt“

ansible db -m copy -a “content=’db conf’ dest=/home/ansadmin/db.conf“

**Download a file from nodes using fetch module ansible adhoc commands

ansible db -m fetch -a “src=/home/ansadmin/demo.txt dest=./demo“

Changed true means ur task executes successfully.

ansible db -m fetch -a “src=/home/ansadmin/demo.txt dest=./newdemo/{{inventory_hostname}}_demo.txt flat=yes“

Above command will download all servers demo.txt files with the name format of their ip names
Ex:56.886_demo.txt
78.452.54_demo.txt

Create or delete a file or directory using adhoc

Create a file:
Here db is an group name insted we can use all also
ansible db -m file -a “path=/tmp/hello.txt state=touch“

ansible db -m file -a “path=/etc/hello.txt state=touch“
It will throgh error bcoz etc belongs to root user if u want to execute u have to add -b or -i
ansible db -m file -a “path=/etc/hello.txt state=touch“ -b

Different modules to work with files ansible ad-hoc command

Reference url : https://docs.ansible.com/ansible/latest/user_guide/intro_adhoc.html

Install packages like git,mysql,httpd,nginx using adhoc commands

su - ansadmin
cd non-production
ansible -m ping all
ansible db -m yum -a “name=git state=latest” -b (here -b used for become root user without this we will get error)
ansible db -m yum -a “name=https state=latest” -b

Check once about command module.

ansible all -m command -a “uptime”
ansible all -m command -a “date”
ansible all -m command -a “who”

Stat (file exist or not)

ansible all -m stat -a “path=/etc/hosts”

Yum install a backage
ansible all -m yum -a “name=git state=latest” -b

-

user (for creating a user) to check users vi /etc/passwd
ansible all -m user -a “name=john” -b

-

Setup is a module which will give the entire information of ansible.
ansible all -m setup

In ansible.cfg
We can set default modules like command & yum .
In privilege escalation
become true means we don’t need mention -b

Ansible Facts & Variables

Ansible facts nothing about information about ur nodes like os,distribution,release,python etc..
The task of collected this remote system information called as gathering facts and collected facts or variable

cd non-production
ansible db -m setup

Create and work with ansible custom facts .

Default facts
Custom facts

cd non-production
ansible all -m shell -a “git --version”
ansible all -m shell -a “/usr/sbin/httpd --version”

This topic not that mush important

Ansible Inventory static & dynamic inventory

Collection of hosts known as ansible inventory

Dynamic inventory are scripted like shell/python for dynamic environment
Cloud is dynamic environment.

By default ansible supports some cloud environments.

Refurl: https://github.com/ansible/ansible/tree/stable-2.9/contrib/inventory
In above file we see that ec2.ini and ec2.py
If we want work on dynamic inventory on aws we need to download ec2.ini & ec2.py
cd non-prod
vi ec2.ini (paste the ec2.ini code)
vi ec2.py (from github copy the code and paste in this file)
chmod 755 ec2.py
Now we have 2 files ec2.py is a dynamic file ,
And ec2.ini is an configuration file.

To run script ./ec2.py
We will ger error bcoz we have python3 not python our ec2script run python thats why
** sudo ln -s /usr/bin/python3 /usr/bin/python
This coomads will move our /usr/bin python 3 to /usr/bin/python now we will run python --version it works.

Now type ./ec2.py
Now it will ask No module named 'boto'

For this we instal boto
For install boto we install python3 thatswhy we run pip3
sudo pip3 install boto

Installing collected packages: boto
Successfully installed boto-2.49.0

Create a role aws and assign to ec2 ansible machine.
Attach or detach a role create a new role
Create a role → ec2→ next→ ec2fullpermission → next review → role name (ec2 full access) → create role

Refresh → Attach or detach a role → choose ec2fullaccess → click on apply.

NOW RUN ./ec2.py (u will get below error to solve this)
ERROR: "Forbidden", while: getting ElastiCache clusters[ansadmin@ip-172-31-9-112 non-prod]$ ^C
sudo vi ec2.ini
/ElastiCache (search for this uncomment it)
./ec2.py

After running under
 "ec2": [
    "13.126.158.22"
  ],

We saw our ec2 instances.

Here by default group is ec2
If u want to run dynamically inventory
ansible -i ec2.py ec2 -m ping

After setup again new ewquirement came u have to do means simply u took previous server ami image and simply we can run on that server it will run.

Real time above ami procedure we can follow.

** if managing nodes don't have python we can communicate through raw module.

Working with managing nodes with password

There 2 ways to connect
1. Using sshkeys
2. Using ssh password

Launch one new instances and create a ansadmin user and provide root previliges.

vi /etc/sshd_conf
PasswordAuthentaction : yes
service sshd restart
Now from ur ansible engine trt connect new ssh node
ssh newnodeipaddress
It will ask password enter now u get acees of node

Same like that if u want ping node
ansible all -m ping -k
It will ask password
Here -k is for asking password
If u want to install git or httpd
ansible ipaddress -m yum -a " name=git state=latest" -k -b
-k is for asking password to login
-b is for become root previlizes

If visudo
ansadmin all

At a time 4 ansible engine doing something
ansible ipaddress -m yum -a " name=git state=latest" -k -b -K
-K capital is for sudo password
-k small k is for ssh password

Execute ansible tasks with default and different users

When u login ansadmin and u will execute any commands it will run on default user ansadmin

If u want run on different user
Go to ur nodes and create user and make it password

When u r executing tasks from ansible engine at that time u just add -u username
Ex:
ansible nodeipaddress -m file -a “path=sample.txt state=touch” -k -u xyz

To login from server to node with username
ssh username@password

-u remote user to connect
But when u login ansadmin and running on tasks that time default user is ansadmin

Ansible Variables

Variables used to store the values
Ansible variables names should be letters,numbers,underscores and they should always start with letter.
Types:
Default variables,
Inventory variables.
Facts and local facts
Registered vars etc.

Default variables are :
inventory_hostname
Inventory_hostname_short
groups/groups.keys()

ansible all -m debug -a “msg=’this is debug module’ “
ansible all -m debug -a “var=inventory_hostname“
ansible all -m debug -a “msg={{inventory_hostname}}“
ansible all -m debug -a “var=groups“

Debug works only on server master not nodes

Ansible Play Books.

Two ways to execute tasks in mange nodes
1.ad hoc commands
2.Play books

If u want to run multiple tasks at all servers at that time we can user playbooks
Ex : i want to install httpd,nginx , mysql at a time
But in ad hoc commands
ansible all -m yum -a “name=httpd state=latest” like that we need to write single commands but playbook at a time we can configure all servers

Playbook:
It build on yaml language

Structure of playbook
Task
Play
Playbook

***refurl: https://docs.ansible.com/ansible/2.3/playbooks.html

Sample ansible playbook:
---(represents its a playbook file)
 - hosts: all
   become: yes
   tasks:
   - yum: name=httpd state=latest

ansible-playbook sample.yml (to run ansible playbok)

Simple playbooks:
cd non-prod
vi hosts (we have 2 groups assume)
[web]
1452.24.23434
45,545.545
[db]
44.44.4454
856.252.45

Now i want shift a file only to the web group servers only
ansible web -m copy -a “src=sample.txt dest=tmp/ “

In playbook

```
---
 - name: this is a sample test of web servers
   hosts: all
   gather_facts: false
   become: yes
   tasks:
   - name: copying files
     copy:
       src: samp
       dest: /tmp
   - name: this is first task
     file:
       path: /tmp/rajnew
       state: touch
   - name: directory
     file:
       path: /tmp/fold1
       state: directory
```

3

```
---
 - name: this is a sample test of web servers
   hosts: all
   gather_facts: false
   become: yes
   tasks:
   - name: this is first task
     yum:
       name: httpd
       state: absent
   - name: this is first task
     yum:
       name: wget
       state: absent
```

Basic Key points to run ansible

To run ansible playbook in shortcut
cd non-prod
which ansible-playbook
/usr/bin/ansible-playbook
Copy above path go to ur yaml or yml file at top
- - -(remove this hyphen and paste inthis place)
#!/usr/bin/ansible-playbook (save it)
chmod +x ymlfile.yml
./ymlfile.yml (thats it it will execute)
Above is the way for without running ansible-playbook filename

Now if u want check ur syntax error of yml file
./filename.yml --syntax-check
If it's no errors it will display playbook name otherwise it will display errors

Dry Run.

It won't affect any task on your nodes it will just tell you what will happen if u run this ansible playbook

Command:
./filename.yml ---check
--check (its a dry run it will what will happen if u run)

When u run
./file.yml -v (it will give extra information while running on server)

-v (verbose mode)
-vvvvv(how its going to connect it will give detail information)

Basic concepts about playbook.

print any message using playbook

We r using debug module
This module prints statements during the executions and can be useful for debugging variables or expressions

It accept 3 parameters
msg ,var , verbosity

```
---
 - hosts: web
   tasks:
   - name: debug module
     debug:
       msg:
        -  "under debug array message1 "
        -  "under debug array message2”
        -  “variable printing: {{inventory_hostname}}”
```

If want print message along with variable follow above procedure msg
Below debug remove total msg array and write

```
       var: inventory_name
```

Ansible variables

A variables defined by us called custom variable

```
- - -
 - hosts: web
   vars:
    x: 23
   gather_facts: false
   tasks:
   - name: debug module
     debug: var=x
```

if u want to display multiple variables

```
- - -
 - hosts: web
   vars:
    x: 23
    b: 24
   gather_facts: false
   tasks:
   - name: debug module
     debug:
      msg:
       - "first vaiable is {{x| type_debug}}"
       - "second vaiable is {{b}}"
```

Ansible Data Structures

Its used to stores multiple data or roles
Collection of multiple values into single variable

```
---
 - hosts: all
   vars:
     x: 23
     pkg: ['httpd', 'vim', 'nano']
     pkg2: {'linux': 'httpd', 'ubuntu': 'apache2'}
   gather_facts: false
   tasks:
   - name: debug module
     debug: var=pkg
```

Usage of register find bash version of all nodes.

When ever playbook run it will generate output that output we store in ansible register variable
We can use that variable in different scenario like condition statements and logging
vi bashversion.yml

```
- - -
 - hosts: web
   gather_facts: false
   tasks:
   - shell: "bash --version"
     register: bashvariable
   - debug var=bashvariable.stout.split("\n")[0].split()[3]
```

(stout is to pront output of register variable)

Split (to split the output)

How to Read and print a variable value.

It used to run an playbook while that time u can pass some values and you can read that values in Console
The command is
vars_prompt

Creating username and password

```
---
 - hosts: all
   vars:
    x: 23
    b: 24
   vars_prompt:
       - name: username
         promt: enter username
         private: false
       - name: password
         promt: enter password
         private: false
   gather_facts: false
   tasks:
    -    debug:
           msg: "username is {{username}} and password {{password}}"
```

Reading variables from file

vi sample1.yml

```
---
foo: "Hello"
```

vi mainfile

```
- hosts: all
  vars_files:
    - "sample1.yml"
  tasks:
    - debug: var=foo
```

here foo is the variable of sample1 file

Working with command line arguments (dynamic)

Dynamic passing on execution
vi sample1.yml

---
foo: "Hello"

vi mainfile

- hosts: all
  vars_files:
    - "{{ name }}.yml"
  tasks:
    - debug: var={{ foo }}

To run an ansible playbook

```
ansible-playbook mainfile.yml -e "name=sample1" -c local
```

Command line arguments

When we run on ansible that time we can pass that values

```
---
- name: dynamic yum install
  hosts: all
  become: yes
  gather_facts: false
#   vars:
#    val: "{{x}}"
  tasks:
  -  debug:
      msg:
      - "{{val}}"
```

```
ansible-playbook raj.yml -e "val=24" --check
```

```
---
 - hosts: all
   gather_facts: false
   become: yes
   tasks:
   - name: debug module
     yum:
         name: "{{pkg}}"
         state: "{{state}}"
```

```
ansible-playbook raj.yml -e "pkg=httpd state=latest"
```

Usage of gather facts:

Collecting information of nodes using gather facts

Working with inventory hostname with hostvars

```
- - -
 - hosts: web
   gather_facts: false
   tasks:
   - debug: var=inventory_hostname
   - debug: var=hostvars[inventory_hostname]
```

in hostvars
by default we fetch information all inventory aling with this host name

---

For playbooks if u want gui u can download microsoft visual studio code----------

Ansible Arithmatic Operators

```
---
 - hosts: all
   vars:
    x: 23
    y: 24
   gather_facts: false
   tasks:
   - name: debug module
     debug:
      msg:
       - "The value of x is {{x}}"
       - "The value of y is {{y}}"
       -  "{{x}} + {{y}} = {{x+y}}"
       -  "{{x}} - {{y}} = {{x-y}}"
       -  "{{x}} * {{y}} = {{x*y}}"
       -  "{{x}} / {{y}} = {{x/y}}"
```

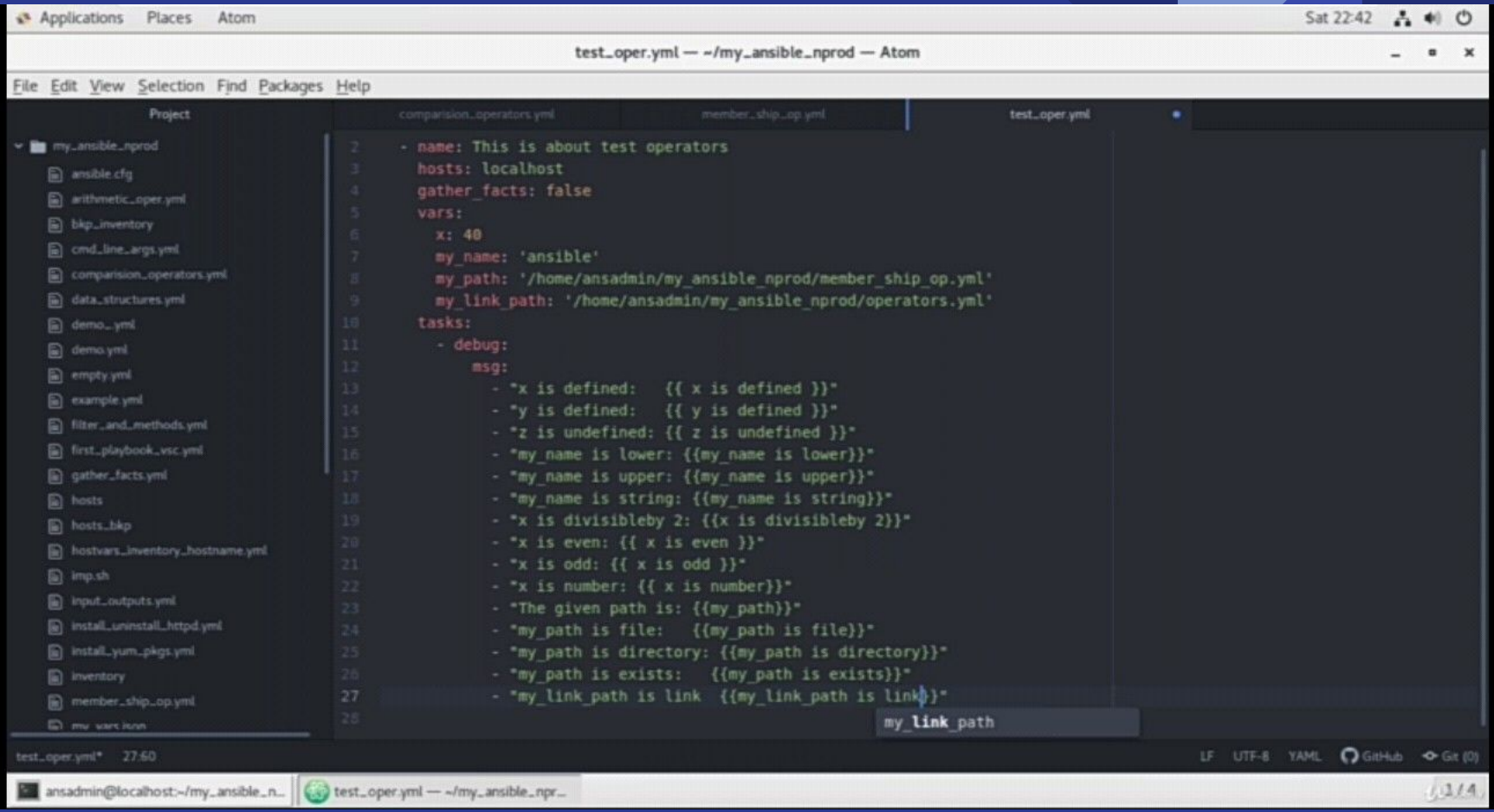
Run ur playbook.

Ansible Filter Methods

```
---
 - hosts: all
   vars:
    x: “this is sample text”
    y: “12”
    z: {4,5,6}
   gather_facts: false
   tasks:
   - name: debug module
     debug:
      msg:
       - "{{x|lower}}"
       - "{{x|upper}}"
       - "{{x|title}}"
       - "{{x.lower()}}"
       - "{{x.upper()}}"
       - "{{y|int}}"
       - "{{z|min}}"
       - "{{x|max}}"
       - "{{x.split()}}"
```

To know more search on ansible filter documentation
Run ur playbook.

Membership Operator



Conditional Operator

```
---
- name: simple play to install httpd
  hosts: all
  become: yes
  tasks:
  - name: installing httpd using yum
    yum:
      name: httpd
      state: absent
    when: ansible_distribution == "RedHat"
  - name: installing httpd using apt
    yum:
      name: git
      state: latest
    when: ansible_distribution == "RedHat"
```

```
---
 - name: imple play to install httpd
   hosts: all
#   gather_facts: false
   become: yes
   tasks:
     - name: Update Existing Packages
       yum: name=httpd state=latest
       when: (ansible_distribution == "CentOS") or
           (ansible_distribution == "RedHat")
```

Run ur playbook

```
---
- hosts: all
  gather_facts: False
  tasks:
    - name: Check Dist Version
      shell: cat /etc/os-release
      register: response

    - debug: msg="{{ response.stdout }}"
```

Adhoc

ansible stream -m setup| grep distribution

Handlers:

```
- name: mukesh
  hosts: all
  become: yes
  tasks:
  - name: Install nginx
    yum:
       name: nginx
       state: present
    notify:
      Start nginx
  handlers:
  - name: Start nginx
    service:
       name: nginx
       state: started
```

Loops.

```
---
- hosts: web
  gather_facts: false
  become: yes
  tasks:
  - name: installing httpd using yum
    yum:
      name: httpd
      state: absent
   loop:
       - git
       - tomcat
       - nginx
       - httpd
```

```
---
- hosts: all
  become: yes
  tasks:
    - name: Create new users
      yum:
        name: '{{ item }}'
        state: absent

      with_items:
        - git
        - httpd
```

Run this ansible playbook

Tags
Conditional Operator

```
-  hosts: all
   gather_facts: false
   become: yes
   tasks:
  - debug:
      msg: "this is first task"
    tags:
      - first
      - common
  - debug:
      msg: "this is 2 task"
    tags: sec
```

```
- name: Install applications
  hosts: all
  become: true
  tasks:
    - name: Install vim
      apt: name=vim state=present
      tags:
        - vim
    - name: Install screen
      apt: name=screen state=present
      tags:
        - screen
~
~
```

ansible-playbook tags.yml -t first,sec (now it will execute only first and second tasks).

Real Time java apache tomcat playbook

```
---
-
  become: true
  gather_facts: false
  hosts: server1
  name: "tomcat installation"
  vars:
    req_java: java-1.7.0-openjdk
    set_java: java-1.8.0-openjdk
  tasks:
    - name: "nginx update"
      yum:
        name: "{{req_java}}"
        state: latest
    - name: "updating java"
      alternatives:
        name: java
        link: /usr/bin/java
        path: /usr/lib/jvm/set_java/bin/java
-------------------------------------
```

demo.yml

```
---
-
  become: true
  gather_facts: false
  hosts: server1
  name: "tomcat installation"
  tasks:
    - name: "wget apache tomcat install"
      get_url:
        url: https://downloads.apache.org/tomcat/tomcat-8/v8.5.57/bin/apache-tomcat-8.5.57.tar.gz
        dest: /usr/local
    - name: extracting tomcat url
      unarchive:
        src: "/usr/local/apache-tomcat-8.5.57.tar.gz"
        dest: /usr/local
        remote_src: yes
    - name: renaming tomcat
      command: mv /usr/local/apache-tomcat-8.5.57.tar.gz /usr/local/latest
    - name: running or starting tomcat
      shell: nohup /usr/local/latest/bin/startup.sh
```

Playbooks reference git:
https://github.com/yankils/ansible_for_beginners
yamlinit website name to practise yml playbooks.

Ansible playbook

- A playbook is a text file written in YAML (YAML Ain't Markup Language) format, and is normally saved as .yml.
- The playbook begins with a line consisting of three dashes (---) as a start of document marker.
- An item in a YAML list starts with a single dash followed by a space.
- hosts and tasks are mandatory items in a playbook
- The playbook primarily uses indentation with space characters to indicate the structure of its data
- Modules are used to perform tasks

```
ansible all -m user -a "name=john" -b
```

- Commant start with #

Create and delete nodes using ansible

```
---
 - name: installing packages
   hosts: all
   become: yes
   tasks:
    - name: installing git packages
      file:
       path: /home/ansadmin/demofile
       state: touch
    - name: creating a directory
      file:
       path: /home/ansadmin/directory
       state: directory
```

Copy module

```
---
 - name: installing packages
   hosts: all
   become: yes
   tasks:
    - name: installing git packages
      copy:
       src: /home/ansadmin/host
       dest: /home/ansadmin/
       mode: 0600
```

Httpd install on ansible playbook.

```
---
 - name: installing packages
   hosts: all
   become: yes
   tasks:
    - name: installing http packages
      yum:
       name: httpd
       state: latest
      notify: starting httpd package
    handlers:
    - name: starting httpd package
      service:
       name: httpd
       state: started
```

Note: notify message and
Handler:
Name: name of handler

**notify name and handler name should be same otherwise it will through an error.

Gathering facts:

It will going to get the nodes system information and then it will execute the ansible playbook tasks.

ansible all -m setup

Above command also will give the information of all nodes

If u want disable gathering facts:

```
become: true
  gather_facts: false
  hosts: server1
  name: "tomcat installation"
```

** to search packes installed or not in linux:
rpm -qa | grep wget
rpm -qa | grep httpd
Etc

When condition:

```
---
 - name: installing packages
   hosts: all
   become: yes
   tasks:
    - name: installing http packages
      yum:
       name: httpd
       state: latest
      when: ansible_os_family == "RedHat"
      ignore_errors: yes
    - name: starting httpd package
      service:
       name: httpd
       state: started
      when: ansible_os_family == "RedHat"
    - name: installing apt packages
      yum:
       name: apache2
       state: latest
      when: ansible_os_family == "Debian"
    - name: starting httpd package
      service:
       name: httpd
       state: started
      when: ansible_os_family == "Debian"
```

Uninstalling httpd:

```
---
 - name: installing packages
   hosts: all
   become: yes
   tasks:
     - name: starting httpd package
       service:
         name: httpd
         state: stopped
       when: ansible_os_family == "RedHat"
     - name: installing http packages
       yum:
         name: httpd
         state: absent
       when: ansible_os_family == "RedHat"
```

Adding a copy task to ansible playbook

```
---
 - name: installing packages
   hosts: all
   become: yes
   tasks:
    - name: installing http packages
      yum:
       name: httpd
       state: latest
      when: ansible_os_family == "RedHat"
    - name: starting httpd package
      service:
       name: httpd
       state: started
      when: ansible_os_family == "RedHat"
    - name: installing apt packages
      yum:
       name: apache2
       state: latest
      when: ansible_os_family == "Debian"
    - name: starting httpd package
      service:
       name: httpd
       state: started
      when: ansible_os_family == "Debian"
    - name: coping a file from server to node
      copy:
       src: /home/ansadmin/index.html
       dest: /var/www/html/
       mode: 0666
```

For loop with in items

```
---
 - name: installing packages
   hosts: all
   become: yes
   tasks:
    - name: installing http packages
      yum:
       name: ['git' , 'httpd']
       state: installed
```

Convert sheel commands Ansible playbook

```
- name: setup tomcat
 hosts: all
 become: true
 tasks:
  - name: install java
   yum:
    name: java
    state: installed
   when: ansible_os_family == "RedHat"


  - name: install java on ubuntu
   apt:
    name: default-jdk
    state: present
   when: ansible_os_family == "Debian"


  - name: download tomcat packages
   get_url:
    url: http://mirrors.estointernet.in/apache/tomcat/tomcat-8/v8.5.50/bin/apache-tomcat-8.5.50.tar.gz
    dest: /opt


  - name: untar apache packages
   unarchive:
    src: /opt/apache-tomcat-8.5.50.tar.gz
    dest: /opt
    remote_src: yes


  - name: add execution permissions on startup.sh file
   file:
    path: /opt/apache-tomcat-8.5.50/bin/startup.sh
    mode: 0777


  - name: start tomcat services
   shell: nohup ./startup.sh
   args:
    chdir: /opt/apache-tomcat-8.5.50/bin
```

Tags: (when u want execute particular task only)

```
---
- name: this playbook install httpd
  hosts: all
  become: true
  tasks:
  - name: install package
    yum:
      name: httpd
      state: installed
    when: ansible_os_family == "RedHat"
    tags: install_apache
  - name: start apache
    service:
      name: httpd
      state: started
    when: ansible_os_family == "RedHat"
    tags: start_apache
```

ansible-playbook.yml file.yml --tags “install_apache”

Ansible vault

It's a feature of ansible that allows to keep sensitive data such as passwords.

Ansible Vault

Ansible Vault is a feature of ansible that allows you to keep sensitive data such as passwords or keys in encrypted files, rather than as plaintext in playbooks or roles.

- create : to create ansible vault file in the encrypted format
- view: to view data of encrypted file
- edit: to edit encrypted file
- encrypt : to encrypt,an unencrypted file
- decrypt: to decrypt an encrypted file

- --ask-vault-pass : to provide password while running playbook
- --vault-password-file : to pass a vault password through a file.

To create a encrypted file:
ansible-vault create valutpass.yml
It will ask password giveit and write ur file
This is encrypted file

To view the valult file
ansible-vault view valutpass.yml
It will ask password enter and now u can see the data

To decrypt file
ansible-vault decrypt valutpass.yml

ansible-vault encrypt valutpass.yml

Ansible vault with git

in valut-pass.yml
password: rajesh123 (save it here ur username of git)

vi ansible-valut.yml

```
---
- name: ansible palybook to test ansible vault
  hosts: all
  become: true
  vars_files:
    - vault-pass.yml
  tasks:
  - name: clone a repo
    git:
      repo: https://yankils:{{ password }}@github.com/yankils/vault.git
      dest: /opt/ansadmin/test-vault
```

**here password is a variable of vault-pass.yml file

Ansible Roles:

When our playbooks data are going to be bigger its difficult to manage all the tasks i.e we are using ansible playbook.

** Roles are re usability

Ansible galaxy contain the roles

Dynamic

Static

Refurl: https://docs.ansible.com/ansible/latest/user_guide/playbooks_reuse_roles.html
Creating a role:
ansible-galaxy init setup-apache
Ansible galaxy will initialize a role and it will give the directory structure.

```
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml
```

```
---    (its a part1)
- name: this playbook install httpd
  hosts: all
  become: true
  vars:
    port: 8082
  tasks:
  - name: install package
    yum:
      name: httpd
      state: installed
    when: ansible_os_family == "RedHat"
    notify: start apache

  - name: install apache2
    apt:
      name: apache2
      state: present
    when: ansible_os_family == "Debian"
    notify: start apache2

  - name: copy index.html
    copy:
      src: /opt/ansible/index.html
      dest: /var/www/html
      mode: 0666
```

```
- name: Ensure the default Apache port is {{ port }}
  lineinfile:
    path: /etc/httpd/conf/httpd.conf
    regexp: '^Listen '
    insertafter: '^#Listen '
    line: Listen {{ port }}
  when: ansible_os_family == "RedHat"
  notify: restart apache

- name: Ensure the default Apache port is {{ port }} on ubuntu
  lineinfile:
    path: /etc/apache2/ports.conf
    regexp: '^Listen '
    insertafter: "# /etc/apache2/sites-enabled/000-default.conf"
    line: Listen {{ port }}
  when: ansible_os_family == "Debian"
  notify: restart apache2

handlers:
- name: start apache
  service:
    name: httpd
    state: started     (part 2 completed)
```

All parts in single file: ref url: https://github.com/yankils/ansible_for_beginners/blob/master/setup-apache_backup.yml

```
---
- name: this playbook install httpd
  hosts: all
  become: true
  vars:
    port: 8082
  tasks:
  - name: install package
    yum:
      name: httpd
      state: installed
    when: ansible_os_family == "RedHat"
    notify: start apache

  - name: install apache2
    apt:
      name: apache2
      state: present
    when: ansible_os_family == "Debian"
    notify: start apache2

  - name: copy index.html
    copy:
      src: /opt/ansible/index.html
      dest: /var/www/html
      mode: 0666

  - name: Ensure the default Apache port is {{ port }}
    lineinfile:
      path: /etc/httpd/conf/httpd.conf
      regexp: '^Listen '
      insertafter: '^#Listen '
      line: Listen {{ port }}
    when: ansible_os_family == "RedHat"
    notify: restart apache

  - name: Ensure the default Apache port is {{ port }} on ubuntu
    lineinfile:
      path: /etc/apache2/ports.conf
      regexp: '^Listen '
      insertafter: "# /etc/apache2/sites-enabled/000-default.conf"
      line: Listen {{ port }}
    when: ansible_os_family == "Debian"
    notify: restart apache2

  handlers:
  - name: start apache
    service:
      name: httpd
      state: started

  - name: start apache2
    service:
      name: apache2
      state: started

  - name: restart apache
    service:
      name: httpd
      state: restarted

  - name: restart apache2
    service:
      name: apache2
      state: restarted
```

Now we are going t convert ansible playbook into role: (reusability):

```
---
- name: this playbook install httpd
  hosts: all
  become: true
  roles:
    - setup-apache
```

```
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml
```

In our previous playbook we configure in role
->var should be place in vi vara/main.yml
->tasks means below all task all data copy & place from starting without spaces
->files: cp /opt/ansible/index.html files/
->handlers: vi handlers/main.yml (copy below handler code paste it)

-> if u miss anything it will take from default:
vi defaults/main.yml
Port: 8080

** note in a role task is mandory remaining all are optional
To check port no:
cat /etc/httpd/conf/httpd.conf | grep Listen

Real time ansible php webapplication

Go to ur ur ansible path
cd roles:
Create a role:
ansible-galaxy init phpapp
tree role name
phpapp

```
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml
```

cd tasks for php web applications we need few tasks
httpd.yml (apache server)
vi httpd.yml

```
---
- name: installing httpd server
  yum:
    name: httpd
    state: latest
- name: start apache
  service:
    name: httpd
    state: started
- name: copy file to html
  copy:
    src: index.html
    dest: /var/www/html/
```

vi php.yml

```
---
- name: intsalling php
  yum:
    name: php
    state: latest
- name: copyinh a php file
  copy:
    src: phpinfo.php
    dest: /var/www/html
  notify: restart server
```

vi maria.yml

```
---
- name: install maria server
  yum:
    name: mariadb
    state: latest
- name: install maria db server
  yum:
    name:
      - mariadb-server
      - python3-PyMySQL
    state: latest
- name: start service
  service:
    name: mariadb
    state: started
```

Vi main.yml

```
---
- include_tasks: httpd.yml
- include_tasks: php.yml
- include_tasks: maria.yml
# tasks file for phpapp
```

cd files
vi index.html
vi phpinfo.php

cd handlers

```
---
- name: restart server
  service:
    name: httpd
    state: restarted
# handlers file for phpapp
```

In our main project folder create a file paste this

```
---
- hosts: all
  become: yes
  roles:
  - phpapp
```

```
ansible-playbook file.yml
```

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