Ansible:-

16-5-20 (start 20mins)

ansible can be used as deployment tool. Feature of ansible 1.Variable -we can't put all the variable in jenkins files.

Playbook is nothing but a yaml based configuration file. which contain some instructions like task, action what action you would like to perform

IAC infracture as a code tool. Provisioning tool means creation tool.

Two types of ansible 1.command line which is free 2. Ansible tower we will get the UI(user interface) & support for tool.

Ansible tool is automation tool which contain

1.provisionin tool -cloud resource creation like ec2 instance,s3 azure instances,GCP etc.

2.configuration tool:-once your instance is ready then we can configure it as per requirement ex. install, service, upgrade, downgrade, configiration.

3.patching tool :- os related patching ,App patching

4.Deployment tool:- can be integrated in Devops CICD pipeline.

Ansible master is always linux & node instance may be linux(ssh communication),window(win rm communication),DB(ssh communication)

We will create playbook on master.we will patch ,deployment on node instance.

Installation of ansible(1hours.30mins)

Assignment

1.Install ansible

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17-5-20

From DevOps Trainer - Pune to Everyone: 12:02 PM

http://www.yamllint.com/ For to write yaml code.

From Sachin Kumar to Everyone: 12:10 PM

- name: "please start apache" yum: name=httpd service=start

From DevOps Trainer - Pune to Everyone: 01:00 PM

https://docs.ansible.com/ansible/latest/modules/list\_of\_all\_modules.htmlhttp://www.yamllint.com/

How to ping node from mater?

ansible <<group-name>>/<<private-IP>> -m ping (-m is module)

1.Playbook has extension is .yml or yaml(yet another language)

2.yaml is start with ---(three highpan) no space.

3.Paybook can be divided in 3 section

hosts:- where you want to execute yaml. You can provide group name either private IP address.(group name, multiple group name,IP of instances, multiple IP,dsn name of instance).(we have to create a host file & mentioned the name of group. under the group we have to provide the node IP.) e.g. -hosts: <<group name>>

b.variable(optional):- version,pkgs hots information ,any activity which we want to perform can be variablies.

c.Task:-what kind of action you want to perform. Playbook contain multiple tasks(we called as a plays. plays nothing but task).Tasks should be in order(in sequence as per the actions).

yaml is nothing but key & value pair. After every highpan(-) & colon(:) put one extra space.

we have to follow indentations (2,4,6,8 space).

e.g Below is sample playbook .Name for yaml playbook is sample-playbook

5. host file or inventory file is present in master node.

6.yaml file is present in source code in github.

how to write yaml or yml file it as below,

vi sample-playbook.yml

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- hosts: <<group-name>> here we can used host file or inventory file .Here hosts is key & <<group-name> > is a value.

variable : (two space)

pkg1: tomcat (four space)

pkg2: jenkins

pkg3: docker

tasks: (two space)

- task1 (install yum $pkg1) (four space),yum is a module name

- task2 (remove $pkg2) (when we user - so it's array or list)

- task3 (upgrade $pkg3) (for variable we used $)

- task4 (start $pkg1)

- task5( status $pkg1)

7.how to run the yaml ?

ansible-playbook <<name of yaml fiel.yml>>

8.host file is ini file(.ini (dot ini file))

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9.write a yaml for tomcat installations.

yum module used for redhat ,centries,aws IAM.For depytam.For ubentu we used apt module instead of yum.(yum :name=tomcat state=installed or for ubentu apt name=tomcat state=installed)

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-hosts: amazonweb

tasks: #task should be in order,#array or list follows ordered collection

- name: 'Please install tomcat'

yum: name =tomcat state=installed #yum is a module ,state is what type of operation we want to perform

- name: 'please install java'

yum:

name: jdk-1.8

state: present

-name : 'please update tomcat-user.xml'

lineinfile:

file:

we can write key & value in two way.

A. name=jdk-1.8

or B. name: jdk-1.8 after : we have space.

INT. state may be installed ,present ,latest, remove, absent ,started difference ?

Installed:- it will make sure that it should be installed.

Present:- only specified version should be installed.

latest:-always try to installed latest version only.

remove: To remove the package.

started:- to start the service.In this it will check if the service is not started then start service ,if started then skip.

10.lineinfile is module which use to update or replace the value.

11.Dictionary is like unordered collection.

Assignment.

1.wirte yaml for to installed apache

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- hosts: amazonweb

task:

name:'please Installed apache '

yum: name=httpd state=latest

11.Bydefault inventory file is hosts

12.if have custom inventory file then we can use -i <location of custom inventory file>

e.g. ansible-playbook -i /etc/ansible/pankaj-inventoryfile

13.if we got changed=0 means we have executed task number one. if changed=1 means we executed task successfully.

14.how we check apache is install or not ? ->httpd -version or service httpd status

15.Service is also module.

16.Arrary/list:- same type of data objects,then how to define array/list.array/list follow the ordered collections.

e.g key:value as below

institute: ethans

institute: abc

institute: xyz

above key: value we can convert it into array/list as below,

institute:

- ethans

- abc

- xyz

17.List & array used - or - means list & array.

18.Dictionary follow unordered collection. Dictionary does not used -.Dictionary is nothing but properties of object.

Assignment.

1.Installed apache on node & start it ?

2.write a yaml to install jenkins (1hr 50mins).

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- hots: amazon

org-name: patilinfotech

Dept:

-HR:

- Name: Pankaj Patil

Location:Hinjewadi

Role: HR Head

contno: 12345

- Name: Praskash kumar

Location: S.B.Road

Role: HR Head

contno: 12345

-IT:

- Name: Rutvik Patil

Role: COE

Age: 25 years

DOJ: 1-1-2010

- Name: Chirag Patil

Role: VP

Age: 25 years

DOJ: 1-1-2011

- Name: Yash Patil

Role: Prg manager

Age: 25 years

DOJ: 1-1-2011

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? "-hosts"

: amazonweb

Dept:

HR:

Contanctno: 12345

HR1: ~

HR2:

Name: "Rohit patil"

contanctno: 12354

location: Chinchwad

Location: pune

Name: "Chetan patil"

IT:

EMP1:

Name: "Rutvik patil"

Role: COE

contanct-no: 345678

location: USA

EMP2:

Name: "Chirag patil"

Role: ACOE

contanct-no: "345678"

location: USA

EMP3:

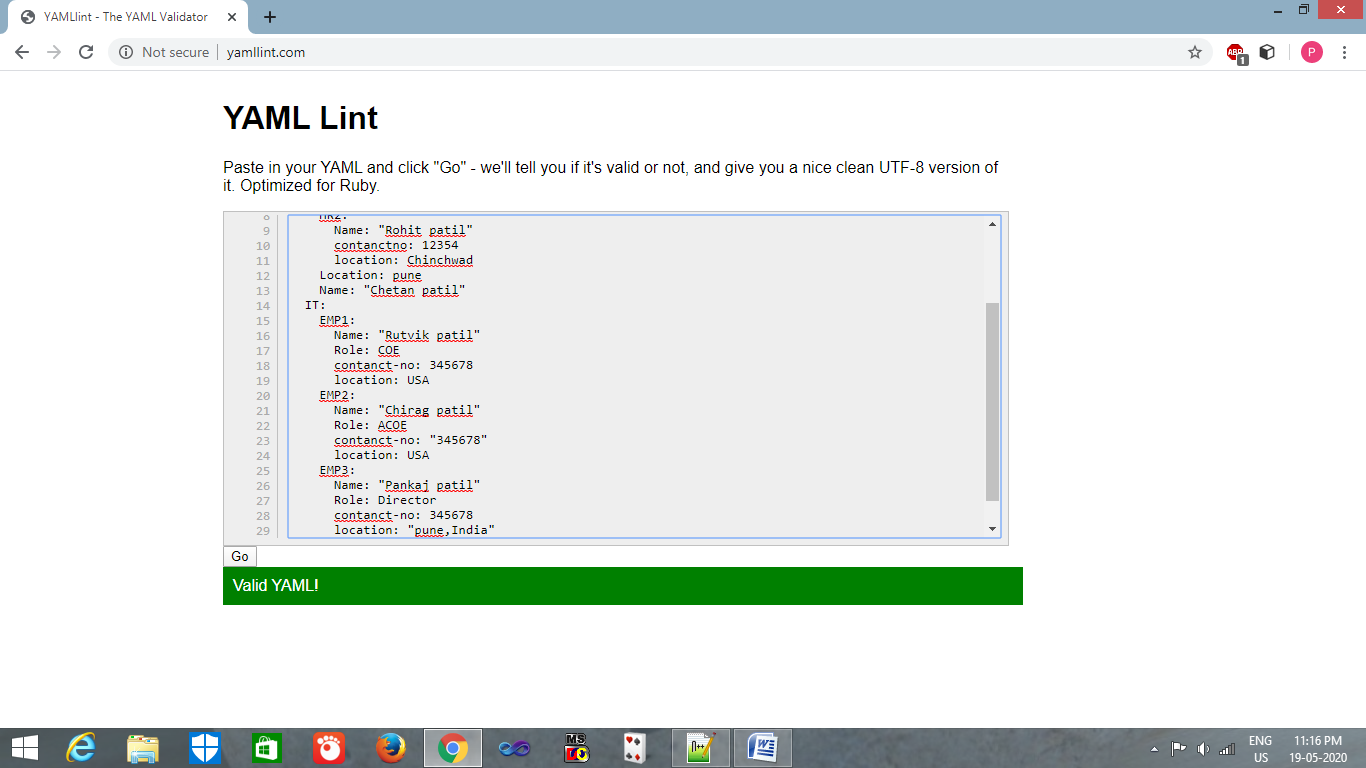
Name: "Pankaj patil"

Role: Director

contanct-no: 345678

location: "pune,India"

org-name: Patil-infotech



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Ansible is an open source automation tool.

it very simple & powerful.

Ansible will execute a task on all server parallely.so it will take less time to complete the task.

Generally writing a shell script is complex compare to playbook & playbooks are very short in code length.

Ansible engine/master/controller .

Ansible nodes/clients /remote nodes.

Inventory/hots file contains the IP/dns name address of nodes.

Ansible.cfg contain the configuration information about nodes like password.

How Ansible engine/master will connect with your nodes or remote server? By using ssh .

Why ansible is called agent less architecture ?

As we are installing ansible on master not on nodes client as well we not installing any agent on nodes clients for to work with this node clients that why ansible called as agent less.

why ansible? 1. simple & open source automation tool 2. no required any software to work with node client.3.its based on phython & yaml 4.highly flexible & configuration management of system.5. large number of ready to use modules for system management(not need to write code)6.you can add custom modules if needed.

why need to do Ansible configuration means we need to work with remote nodes. for this we need to provide the information about nodes.

we will installed ansible on window os as it's not supported for control node but this possible by some setup(setup ansible on windows).

prerequisites for ansible engine/control node:1.OS is RHEL,Linux,ubentu,debian ,centOS,with 2. pythin2.0

we can install ansible in three ways. 1.using yum command for os RHEL(red-hat),Centos .apt for ubentu (easy & best way)2.using pip command basically ansible is one pythen pkg.3.using compile file.

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**Ansible directory structure :-**

tree /etc/ansible/ (by default path for ansible on master )

/etc/ansible/

ansible.cfg it's file configuration details is here.

hosts it's file it contain manage nodes information. Default locations is/etc/ansible/hosts/

roles it's directory

If you want to work with remote nodes/clients then we have to provide the IP address in hosts file. so ansible engine/master will come to know that he has to work with this nodes.

if all server from AWS cloud then use private IP is also ok(it's in same VPN).

ansible all -m ping :- To ping all the nodes which is mentioned in hosts file. it will ping & check the connectivity within master & node of it.

ping is module which give response pong.

./ means current location.

Incase you want to use your dynamically your inventory file than use below option,

e.g. ansible all -m ping -i <<your-inventory-filename>>

if you have not mentioned your inventory file in ansible.cfg file

e.g. ansible all -m ping -i <<your-inventory-filename>>

Incase you have diff diff set of server then also you use above option(we can make multiple inverntory file for set of server, like in one file you mentioned 10 ,in another file you can mentioned 20 server. this is for less utilisations.) or you can mentioned all server in one file make a group of it also.

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**Disable hostkey checking**

**Hostkey checking means,**

when you connect first time with any ansible server using SSH then it will ask you for confirmation like,

Are you sure you want to continue connecting (yes/no/[fingerprint] ?

when you want to make it by default then use this.

many way we can do this.

1.export ANSIBLE\_HOST\_KEY\_CHECKING=False

ANSIBLE\_HOST\_KEY\_CHECKING is environment variable for ansible.if you set this variable value then ansible will not check for hostkey verification. it is only for current session only. if you terminate your server then it will set to by default.

2.In ansible.cfg file you can just uncommitted it so it will be applicable.(for perment purpose)

host\_key\_checking = False

very very IMP us people will try to connect with remote by runing ansible yum or playbook or module or ping command so sometime it will give error. first of all when we going to work with our remote server then we have to do hostkey checking false.

you can disable the warning messages also as just enabling warning in ansible.cfg file.

**VIPM:-**when you use AWS instance for ansible then each time when we are rebooting the instance,the IP address of it will change.so we have to update the new IP address of instance in host file.

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**Introduction to Ansible Ad-hoc commands(video 12)**

we can work with nodes in two way 1. Ad-hoc command :- useful to execute one task on a remote node.you can execute it on single node or multiple node or group or server or multiple group or multiple servers or combination of groups or servers.

Ad-hoc command is the one-liner ansible command that performs one task on the target host(s)/group(s).

2.playbooks :-we can write a ad-hoc command in playbook or you will get output for multiple task using playbook .

uptime command give up time of server

updtime

for Ram usages we below command.it give one simple task output,

free -m

ansible 12.34.53.234 -m shell -a "uptime "

above command shell is a module ,which is useful to execute your shell command on your remote nodes that command you have to provide as a arguments inside the double qute("").Here -a is indicate the argument in this command.

ansible 12.34.53.234:10.80.231.81 -m shell -a "uptime " (multiple remote server).

ansible db:web-server -m shell -a "uptime " (multiple group .here db & web-server is group).

if you wan to execute the ansible command on multiple remote server or multiple group so you to put colon (:) in between two remote nodes.

\*if you want to provide the another hosts file then execute command as below,

ansible -i prod\_inv -m shell -a "uptime" (here -i for dynamic & prod\_inv is inventory/hosts file name)

ansible all -m ping

ansible db:web-server -m ping

above ad-hoc command as a ping

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ansible db:web\_server -m shell -a "uptime"

ansible db:web\_server -m shell -a "free-m"

above ad-hoc command as a shell module

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ansible -i prod\_inv -m shell -a "uptime"

ansible -i prod\_inv -m shell -a "free-m"

above ad-hoc command as a shell module with different inventory(prod\_inv)-i is for dynamic.

Ansible adhoc command syntax as below,

ansible [-i <<inventory-Filename>>] server1\_name: server2\_name or group1:group2 -m module [-a argument-value]

Note: if you have not mentioned inventory file then it will consider bydefault inventory file(hosts)

[] field are optional

-m module :here you have to give module name.

-a argument-value :-we have pass -a & argument value in double quto.

To run the shell file :- sh <file-name >.sh

ansible -doc -l :- it give list of modules. There are around 2000 modules.

Module is a predefine programe,that program is able to execute your task on your manage nodes. or module is nothing but a simple program that is use to execute a task.

ansible ad-hoc command alway's consist of target & modules .Target means(remote node or group-name ) on which target you are going to work with your ansible.& what is the task based on modules.

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**How ansible work. (video 13)**

task is execute on remote node only.

when we execute the ad-hoc command it will check the in inventory file for ip address then ansible will establish the SSH connection parallely with mentioned nodes in inventory file.By default it will create .ansible(dot ansible ) file created & in this file temp(inside ansible file) is created to stored the modules tempary.once the task is done then it will remove the modules.

Ansible execute the task parallel on all the remote nodes.

we have to change the forks value in ansible.cfg equal to number of remote nodes. (if number of remote nodes is 10 the set forks value to 10).

Ansible is pushing modules into remote nodes & your remote nodes is not tring to connect with master node(ansible engine) .Ansible engine is tring to connect with remote nodes.& your ansible engine is pushing that why ansible follow's push mechanism. We have not installl any agent on nodes to connect with ansible engine that why ansible is called agent less architure.

Ansible executes task on managed (remote)nodes parallely.You can make is serial by keeping forks value equals to one in ansible.cfg file.In case of playbook we can mentioned the forks value equal to one also to execute the task serial.

Bydefault ansible execute the task parallely on five (5) remote nodes.

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**Transfer a file using Ansible ad-hoc command. (video 14).**

Our goal is transfer/copy a file from ansible engine to remote nodes.

Transfer file using copy module.

ansible db\_server -m copy -a "src=/source/file/path dest=/dest/location"

once you copy the file fromsource to destination & again you are tring to copy is without any changes in that file so ansible will not copy that file as it's already copied.same seniore is applicable for task also.This one of the porperties of ansible that is called adom potent.

if you want to take a backup of existing file while performing copy operation then use below commend

ansible db -m copy -a "content='This is from copy module' dest=/tmp/hello.txt **backup=yes**"

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**Download filefrom Nodes using Ansible ad-hoc command. (video 15).**

Download a file using fetch module

ansible db\_server -m fetch -a "src=/source/file/path dest=/dest/location"

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**Install a package using yum module on Linux Managed Nodes. (video 18).**

if system: Linux -->module as yum

if system: ubuntue/Debian -->module as apt

if you want to install git then ansible ad-hoc command as

ansible all -m yum -a "name=git state=present" This command give error msg"you need to be root to perform this command"

So we have to tell ansible that run this command with user access by taking root privillage so we just put -b or --become.as below,

ansible all -m yum -a "name=git state=present" -b or ansible all -m yum -a "name=git state=present" --become

Note: to install the package on node user should be root previllege access.

for Apache installation as below,

ansible all -m yum -a "name=httpd state=installed" -b or ansible all -m yum -a "name=httpd state=present" --become

State option are available as : absent,installed,latest,present,removed,

absent is used to uninstalled the packages

installed is used to installed the packages

present is used to installed the packages(the specifies version only)

latest is used to installed the latest packages.

removed is used to remove the packages

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**Introduction to ansible default facts . (video 19).**

Ansible facts nothing but information about managed nodes like O.S. distribution,release,processor,python etc.

The task of collecting this remote system information is called as gathering facts,& collected infromration is called facts or variable.

You can collect/gather facts using **SETUP** module in ad-hoc commands.

INT:-which module ansible playbook run by default? setup

Ansible playbooks call this setup module by default to perform gathering facts task.

synatax :- ansible group\_name -m setup

e.g.ansible db -m setup. it give the information about db group.

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**Create & work with ansible custom facts . (video 20).**

Two types of facts 1.default facts:- 2.custom facts:-when you want to collect extra information about your manage node then create custom fact on your manage node so that you can get the custom fact from your ansible engine.For to get cutom fact setup module is used.custom facts are used to get the user defined required facts.

Suppose we want to get the information which git is installed on nodes then used below command,

by usinbg shell module

ansible all -m shell -a "git -- version"

ansible all -m shell -a "httpd -- version"

if this is repeatative task we have to run this command every two-three day's we have to run this command.so instrad of this way we can create some fatcs on your manage nodes, cuttom facts .For time being we have to create some facts by using setup module.

custom facts nothing but your required values.

create custom facts,

Steps1 :- create /etc/ansible/facts.d on managed nodes.(facts.d is directory)

Steps2:- Inside of facts.d place one more custom facts files with extension as .fact(file is nothing but script)

Steps3:-The output of facts file should be a json format.

Step4:-The fact file should have execution permission.

if we run command git --version below output

git version 2.18.1

if we run command git --version | awk '{print $3}' below output we get

2.18.1 ($3 means from thrid word print the output)

how to run the fact file as below,

./<<file-name>>.fact