12-02-2019

in node we will always run as root user

workstation normal user

server root user

Chef-Server

Pre-instll

Post-install

To access chef:

<https://192.168.100240>

to check the status of the chef server:

#chef-server-ctl status

To check the status from ui

<https://192.168.100.240>

register with chef

[sunilgadgil@yahoo.com](mailto:sunilgadgil@yahoo.com)

How to create a user under chef server?

Chef-server-ctl user-create username fname [mname] lname ‘email’ ‘password’ –f keyfile.pem

Eg: chef-server-ctl user-create siddharth sidharth ojha ‘sojha@mycompany.com’ ‘Test@123’ –f siddharth.pem

It will create username and password

It will create a keyfile , so that we can work via CLI

What is that .pem privacy enhanced mail

# chef-server-ctl user-create siddharth sidharth ojha ‘sojha@mycompany.com’ ‘Test@123’ –f siddharth.pem

#Ls –lh

#Vi siddharth.pem

How to create organization under chef?

Chef-server-ctl org-create ‘org shortname’ ‘org long name’ –a username –f orgkey-validator.pem

Eg: chef-server-ctl org-create ‘Samsung’ ‘Samsung Org’ –a siddharth –f Samsung-validator.pem

Note: in pem file –validator is mandatory

-a 🡪 attach or associate

-f 🡪 will create key file or certificate file

Login to the chef ui with the above created user

First user assigned to organization , he would be the admin user

Create an another user

Create another organization with the name wipro

#Cd /var/mails

#ls

# Steps to setup the workstation?

Setup the CentOS7 VM instance

1 CPU

1 GB RAM

8 GB HDD

Setup hostname

/etc/hostname

Workstation.mycompany.com

3.Set up local DNS

/etc/hosts

192.168.100.240 chef-server.mycompany.com

4. Check the workstation date and time is correct or not?

5.Diable Firewall/SELinux (Optional)

6. Go with DHCP as your network (default)

8.create a user with same name as of the chef-server user

Eg:siddharth

Checking user exists or not

#Id siddharth

7.Reboot the VM

Post installtion

Go to Download.chef.io

download the chef development kit

chefdk-3.7.23-e17.rpm

#Wget <get the url from above doneload link>

Id siddharth

Siddharth is not root user

#Su –

#Rpm –ivh chefdk-3.7.23-e17.rpm

Download the starter kit from the server and put inside user home directory

Starter kit 🡪 chef –ui 🡪Administration tab🡪select correct organization 🡪 click on Starter kit 🡪download

Chef-starter.zip will get download

Upload the above zip to workstation VM with winscp in /home/siddharth

Unzip chef-starter.zip

#yum –y install unzip

When we unzip chef-repo will be extracted

Rename this chef-repo to project name (

Cd chef-repo

Ls -lh

Cd .chef

Download the certificate from the server

#Knife ssl fetch 🡨 download server certificate

#Knife ssl check 🡨 verify server certificate

Conneting the host chef-server.mycompany.com:443 succeefully verified

Ls –l

Kife.rb

Siddharth.pem

Open knife.rb

Vi knife.rb

NOTE: when you work with workstation , you must be in the chef-repo (/home/siddhart/chef-reo)direcotry

#knife user list 🡨

Cd /hom/siddharth

Knife user list

#knife cookbook list

No nodes

#knife node list

No nodes

# How to setup a node?/

Pre-installation step

Get new cent OS 7

1 CPU

1 GB RAM

8 GB HDD

Setup the hostname

/etc/hostname

Samsung-web01.mycomoany.com

Setup local DNS

/etc/hosts

192.168.100.240 chef-server.mycompany.com

4. check the date and time

5. disable SELinux and firewall

7.create a user with sudo access

User: chefadmin

Password:chedadmin

8.Reboot

# Uptime 🡨to check the system is rebooted time

Post –install

1.login as user siddharth on the workstation

2.go to your project directory

3. Bootstap the node -> give the below command from the work station VM

#Knife bootstrap node\_ip -N node\_name -X user -P pass --sudo

Eg.

Knife bootstarp 192.168.100.x -N Samsung-web-01.mycompany.com -x chefadmin -P chefadmin --sudo

-N = node name

-x = user name

-P (CAP P) = password

Go chef admin ui

Click on the nodes , it will show the node registered

Go to work station

#knife node list

13-02-2019

Chef

chef-server

workstation

samsung-web01

First Cookbook

Cook book 🡪 recipes 🡪 resources

1.Workstation

a. create cookbook

b. write a recipe with resources

c. test the cookbook

d. upload to the server

e. attach the cook book to the node

2.node

a. run the client

chef generate cookbook <path/cookbook\_name>

e.g.

#cd /home/siddarth/chef-repo

#chef generate cookbook cookbooks/file\_test

#git config --global usern.name “Siddarth Ojha”

#git config –global user.email “Amaravadi.sasik”

#tree cookbooks/file\_test

Metadata.rb 🡨 cookbook name ,ver, dependencies

Recipes 🡨recipe folder

#vi cookbooks/file\_test/recipes/default.rb

# refer https://docs.chef.io/resource\_file.html

#resource\_type ‘resource\_name’ do

#attribute1 value1

#attribute2 value2

#action action\_name

#end

# refer https://docs.chef.io/resource\_file.html

#refer the above documentation for more attribute list

file ‘tmp/dummy.txt’ do

owner ‘root’

group ‘root’

mode ‘0755’

content ‘This file is created by chef on 13th Feb 2019’

action :create

end

:wq!

#check the syntax of the file

#Cookstyle <path/cookbook\_name>

Eg:

#cookstyle cookbooks/file\_test

#cookstyle –L cookbooks/file\_test

#vi cookbooks/file\_test/metadata.rb

#update allt e basic information

Upload the cook book to the srver

#knife cookbook upload <cookbook\_name>

#Knife cookbook list

Step d:

Attach cookbook tonode

Login to ui

Nodes tab

Edit settings assign the cook book

Node VM

ls -l /tmp/dummy.txt

Samsung-web01# chef-client

Check the file

ls -l /tmp/dummy.txt

run the clinet command again

Samsung-web01# chef-client

#update the file content and run the client command and see

# 14-02-2019

#rpm –qa chefdk

#which chef

Write a cookbook to create a web-server?

In workstation:

#yum install httpd

systemctl start httpd

systemctl enable httpd

vi /var/www/html/index.html

Cd ched-repo

Git init

#chef generate cookbook cookbooks/web\_test

Ls-ltr

#Vi cookbooks/web\_test/default.rb

#refer the docs for more information

#yum –y install httpd

#package resource

Package ‘httpd’ do

version: ‘2.4.6’

action :intall

End

#systemctl start httpd

Service ‘httpd’ do

action :start

end

#systemctl enable httpd

service ‘httpd’ do

action :enable

end

#vi /var/www/html/index.html

file ‘var/www/html/index.html’ do

content ‘Welcome to samsung-web01 service’

owner ‘apache’

group ‘apache’

mode ‘0644’

action :create

end

:wq

#test the above file

#cookstyle cookbooks/web\_test

Fix all syntax errors

#update the metadata

Vi cookbooks/web\_test/metadata.rb

With basic information

:wq

#knife cookbook list

workstation # knife cookbook upload web\_test

workstation#knife cookbook upload web\_test

w#knife cookbook list

w#knife node list

w#knife node show

How to attach the cookbook to node

#Knife node --help

w#knife node run\_list add samsung-web01.mycompany.com web\_test

### Login to node (Samsung-web01)

Root#chef-client

Stop the httpd and remove the index.html and then run the chef-client command

root@s#chef-client

## How to automate chef-client run on each node

1. Run the chef-client in daemon mode
2. Run the chef-client after every 10-15 min

Schedule a job to run after 15 min

Cron

Minutes hour <day of month> month <day of week> job/command/script

Minutes – 00-59

Hour – 00-23

Day of month – 01-31

Month – 01-12

Day of week 01-07, where 01/07 are Sunday

01-Sunday

02-Monday ..etc

Minutes hour <day of month> month <day of week> job/command/script

30 01 \* \* \* /scripts/daily\_backup.sh

00 20 \* \* 01 /scripts/weekly\_backup.sh

30 03 01 \* \* /scripts/monthly\_backup.sh

00,15,30,45 \* \* \* \* /scripts/collect\_data.sh 🡪 run for every 15 mins

\*/5 \* \* \* \* /scripts/monitor\_disk.sh 🡪 run for every 5 mins

\* \* \* \* \* /scripts/test.sh 🡪 run for every minute

We cannot schedule below one minutes , we cannot set the cron for seconds

Homework :

Write a job to run it at every 90 min?

Package name for cron is : cronie

Service : crond

## chef supermarket

<http://supermarket.chef.io>

#workstatoin chef-repo#knife supermarket download cron 6.2.1

tar -xvfz cron-6.2.1.tar.gz -C cookbooks

-x extract

-v verbose

-f file

-z unzip

-C (cap c) target directory

Ls -l cookbokks

Cookstyle cookbooks/cron

Workstation#Vi cookbooks/cron/recipes/defaulter.rb

#updae the cron\_d resource details

Cron\_d ‘run fir every 15 mins’ do

Corn\_name ‘chef-client-run’

Minute ‘\*/15’

Command ‘/bin/chef-client’

User ‘root’

End

:wq

#Cookstyle cookbooks/cron

Cd cron

Vi metadata.json

#knife supermarket download cron 6.1.1

#chef generate cookbook cookbooks/cron

Vi vookbooks/cron/recipies

Package ‘cornie’

Service ‘crond’ do

Action :start

End

Service ‘crond’ do

Action :enable

End

File ‘/var/spool/cron/root’ do

Content ‘\*/15 \* \* \* \* /bin/chef-client’

Owner ‘root’

Group ‘rrot’

Mode ‘0600’

Action :create

End

:wq

s# crontab -l

s#crontab -e

30 02 \* \* \* /scripts/daily\_backup.sh

Cookstyle cookbooks/cron

Vi cookbooks/cron/metadata.rb

Cookstyle cookbooks/cron

Knife cookbook upload cron

Knife node run\_list add samsung-web01.mycompany.com cron

Samsun-web01#chef-client

Cat /var/spool/cron/root

## 15-02-2019

Sir is on leave

# 18-02-2019

Chef

Chef-server

Workstation

Node

Cookbooks

Supermarket

File\_test

Cron

## Attributes

Attributes in chef is called variables.

System variables = system attributes

User variables= user defined attributes

Where I can define system generated attributes?

1. Using ohai

Ohai will collect the data from nodes and upload to the chef server.

1. In the cookbooks
2. Recipe section
3. Attribute section
4. Roles
5. environments

How to write an attribute?

node[‘attr\_name’] = value;

node[‘hostname’] = Samsung-web01

node[‘platform’]=centos

node[‘memory’][‘free’]=”613332kb”

Note: Ohai will collect the data from nodes and upload to the chef server.

Samsung-web01#hostname

S#ohai

S#ohai | wc –l

S#ohai hostname

S#ohai ipaddress

S#ohai os

S#ohai platform

S#ohai memory

Workstation#cd chef-repo

ls –l cookbooks

W#vi default.rb

#define variables

**package\_name**=’httpd’

service\_name=’httpd’

document\_root=’/var/www/html’

Package **“package\_name”** do

Action :install

End

If we have

$VARNAME –SHELL

#{VAR NANEM} – CHEF

File “**#{document\_root}**/index.html” do

…

…

..

end

Workstation#cookstyle cookbooks/web\_test

W#Vi cookbooks/metadata.rb

Change the version of the metadata

w#knife cookbook upload web\_test

w#knife node list

w#knifw node show Samsung-web01.mucomany.com

Samsung-web01#chef-client

Note: Need to push the cookbook to the git

Workstation#Cd chef-repo/cookbooks/web\_test

Ls –l

Workstation web\_test#chef generate attribute .

Ls –l

We can see attributes folder

Web\_test#Vi attribute/default.rb

Case node[‘plaform’]

When ‘centos’ , ‘rhel’

node[‘Package\_name’] = ’httpd’

node.default[‘package-name’] = ‘httpd’

node[‘service\_name’]=’httpd’

node[‘document\_root’]=’/var/www/html’

when ‘ubuntu’,’debain’

node[‘package\_name’] = ‘apache2’

node[‘service\_name’] = ‘apache2

node[‘document\_root’] = ‘var/www/html’

end

Workstation web\_tes #vi reciepies/default.rb

Remove the variables defined in the file

package node[‘package\_name’] do

Action :install

End

service node[‘servce\_name’] do

..

end

service node[‘service\_name’] do

..

end

file “#{node[‘document\_root’]}/index.html” do

..

end

vi metadata.rb

change the version to 3.0

#cookstyle .

#knife cookbook upload web\_test

#samsung-web01# chef-client

#vi attribute/default.rb

Change the variable definition syntax

Vi cron/recipies/default.rb

What are templates?

It is a script with .erb extension , using which we will create static files

Index.html.erb 🡪 index.html

Httpd.conf.erb= httpd.conf

.erb = embedded ruby

How to write attributes in template file

<%= ATTRIBUTENAME %>

Workstation# ls –l cookbook/web\_test

Worsstation chef-repo#chef generate template cookbooks/web\_test

#chef generate –help

Cd chef-repo/cookbooks/web\_test

#Chef generate template .

Vi templates/index.html.erb

<html>

<h1> Wecome to <%= node[‘hostname’] %> <h1>

<body>

This webserver has <%= node[‘ipaddress’] %>Ip address <br>

This server has <%= node[‘memory’][‘swap’] %> Memory<br>

I have defined <%= node[‘package\_name’] %> variable <br>

</body>

</html>

Worstation #Vi recipes/default.rb

template “#{node[‘document\_root’]}/index.html do

source ‘index.html.erb’

owner ‘apche’

group ‘apache’

mode ‘0644’

action :create

end

w#cookstyle .

w#vi metadata.rb

change the version number

w#checkstyle .

Knife cookbook upload web\_test

Samsung-web01#chef-client

check by giving httpd ip address in the browser

Homework :

Wordpress installation in the nodes by using chef template

# **19-02-2019**

## **User management using chef?**

Username

Password

Group

Home\_dir

Mail box

UID

GID

Shell

The password stored in /etc/shadow encrypted

encryption type

1. md5
2. bowlfish
3. sha1
4. .
5. .
6. sha512

Salt

It is a random string generate by OS, to make your password more complex.

Enc\_pass = actual pass + enc\_type + salt

openssl passwd -type -salt <salt name> <actual\_pass>

openssl passwd -1 -salt tata redhat

Atomate the following user creation

username : siddarth

password :$1$tata$3hkhdsjkfdkfjdkfjk

group :siddharth

home :/home/siddharth

shell :/bin/bash

manage\_home: true

1. Create cookbook

Chef generate cookbook cookbooks/user\_test

Vi cookbooks/user\_test/recipes/default.rb

group ‘siddharth’ do

action :create

end

user ‘siddharth’ do

password ‘$1$tata$3sdfsdfdnmd87dfkd

group ‘siddharth’

home ‘/home/siddharth’

shell ‘/bin/bash’

manage\_home true

action :create

end

:wq

1. Test the cookbook

Cookstyle cookbooks/user\_test

1. Update metadata.rb file with basic info and version
2. Upload the cook book

Knife cookbook upload user\_test

1. Attach it to the node

Knife node list

Knife node show Samsung-web01.mycompany.com

knife node run\_list add samsung-web01.mycompany.com user\_test

Run this on the node Samsung-web01

Samsung-web01#chef-client

Update the password and run the chef-client command again to see the updates effect or not

#rpm –ql chefdk |grep

## What is data bag?

It is global variable

It is always stored in the chef-server

It is available in normal and encrypted form

It is stored in JSON format

It is stored in the index form

1. Create data bag on chef-server
2. Upload the data to data bag
3. Update your cookbooks to use this data bag

## How to work with data bag?

Knife data bag list

Knife data bag create <dbagname>

Knife data bag show <dbagname>

Knife data bag from file <dbagname> <datafile.json>

Workstation# knife data bag list

Knife data bag –help

W#Knife data bag create siddharth\_secret

Workstation# knife data bag list

We can see the bag list on chef ui as well

Under polacies tab

W#vi siddharth\_password.json

{

“id” : “siddarth”, 🡪 key to identify the password value

“Password”:”$1$tata$3dfdf89d898099”

}

W# knife data bag from file siddharth\_secrets siddharth\_password.json

W#knife data bag show siddharth\_secrets

siddharth

W#knife data bag show siddharth\_secrets siddharth

Rm siddharth\_password.json after uploading it to the server

Commit all the cookbooks in git

W# use the password from the data bag in the cookbook

W# vi cookbooks/user\_test/recipies/default.rb

Var\_name = data\_bag\_item[dbagname,key]

user\_data=data\_bag\_item(‘siddharth\_secrets’,’siddharth’)

user ‘siddharth’ do

..

password user\_data[‘password’]

..

end

cookstyle cookbooks/user\_test

update metadata.rb

cookstyle cookbooks/user\_tes

Workstation chef-repo# knife cookbook upload user\_test

samsung-web01# chef-client -log\_level debug

cd /var/chef/cached/cookbooks path to check the cookbook stored at node side

# 20-02-2019

cookstyle cookbooks/web\_test

package ‘httpd’ do<no space after this>

<2 spaces only>attribute<one space>‘value’

<2 spaces only>action<one space>:install

end

<one line gap>

service …

Roles

Environment

What is a role?

It is a collection of cookbooks , with specific order

Samsung-web01

Run\_list

Cookbook1 web

Cookbook2 php

Cookbook3 mariadb

Cookbook4 phpmyadmin

Cookbook5 wordpress

samsung-web01

run\_list

role\_lamp(c1,c2,c3,c4)

c5 wordpress

How to create a roles?

1. Create roles via command line
2. Create roles via file <this method is recommended>

Workstation chef-repo# knife role list

Workstation chef-rep]#Knife role –help

W#knife role create role\_lamp

W#which vim

W#export EDITOR=’/bin/vim’

W#knife role create role\_lamp

{

“name”:”role\_lamp”,

“description”:”This is LAMP Role”

“run\_list”:[

“file\_test”,

“user\_test”

]

}

From chef ui also we can create role

Go to policy tab

W#knife role show role\_lamp

W#knife role show role\_lamp –f json

W#knife role show –help -F json

W#cd /chef-repo/roles

W#knife role show role\_lamp –F json > role\_lamp.json

Create role from file

W#knife role –help

W# knife role from file role\_postfix.json

W#knife node list

W#knife node show samsung-web-01.mycompany.com

What is an environment?

Torun specific version of the cookbook we need to create environment

Workstation chef-repo#mkdir environments

Cd environments

Knife environment list

\_default

W#knife environment create env\_test

From ui we can ceate environment and use that for command line

W#knife environment list

Knife environment show env\_dev -F json

Knife environment show env\_dev -F json > env\_dev.json

Knife node list

knife node --help

knife node environment set Samsung-web01.mycomapny.com env\_prod

NOTE : in a single node only one environment

Workstation environments # knife environment compare env\_prod env\_dev env\_test

mkdir scripts

Cd scripts

vi create\_environments.sh

#!/bin/bash

#to create environment from files

for ENVNAME in `ls /home/siddharth/chef-repo/enviroments/env\*.json`

do

knife environment from file $ENVNAME

done

#knife role list

ls /home/siddharth/chef-repo/roles

#!/bin/bah

#to create multiple roles in one go

for NEWROLE in`ls /home/siddharth/chef-repo/roles/role\*.json`

do

knife role from file $NEWROLE

done

How to take the backup of chef server

#chef-server-ctl backup

How to restore chef server

#chef-server-ctl restore

# **21-02-2019**

Devops

Linux

Git

Shell Script

LAMP

Wordpress

Chef

Java

.java 🡪 compiled 🡪 .class

HLL LLL

High level lang Low level language

Compiler interpreter

----------- ---------------

One time every time

Fast Slow

Compile app.java app.class

Test testapp.java testapp.class

Package app.class 🡪 app.jar or app.war

.jar 🡪 is a collection of .class files

Java archive (similar to tar)

.war 🡪 web application archive

Collection of .clasesse and .jar

.ear 🡪 enterprise archive edition

Artifact is nothing but jar/war/ear

1. Create a project
2. Give that project to developer

Ant

Maven 🡨 build tools

For .net projects the artifact will be generated with .exe or msi (Microsoft image)

Maven is java dependent

Java 🡪 to run the project

Javac 🡪 to compile the java class

Java –veriosn

Javac –version

Install java

Yum –y install java-1.8.0-openjdk

Install javac

Yum –y install java-1.8.0-openjdk-devel

## How to get maven?

1.Download the maven

Use wget/curl to download the maven

2.Unzip the gz file to /opt directory

**NOTE: all third party products goes in /opt dir**

**tar –xvfz apache-maven-x.x.gz -C /opt**

**-C is to specify the target directory**

**3. Set up the environment**

M2\_HOME=/opt/apache-maven-3.6.0

PATH=$PATH:$M2\_HOME/bin

export M2\_HOME=/opt/apache-maven-3.6.0

export PATH=$PATH:$M2\_HOME/bin

**NOTE**:for permanent path setting need to update ~/.bash\_profile file

~/.bash\_profile is per user

If we want to set the path for all the users need to update /etc/profile files

**$vi ~/.bash\_profile**

export M2\_HOME=/opt/apache-maven-3.6.0

export PATH=$PATH:$M2\_HOME/bin

**4.Check it**

**$mvn -version**

**Maven command?**

**Mvn archtype:generate 🡪 to create a project structure**

**Mvn compile**

**Mvn test**

**Mvn package 🡪 to create a package**

**Mvn install 🡪 to install in local repo**

**Mvn deploy 🡪 to install on remote repo**

**Mvn clean**

Maven Home Dir : ~/.m2

Generate a maven project

mvn archtype:generate

SNAPSHOT mean temporary version

$tree /home/devops/SamsungJarProject

pom.xml (Project Object Model)

**NOTE :** To validate pom.xml syntax is correct or not

mvn validate pom.xml

mvn package

jar –tvf target/Samsung-1.0-SNAPSHOT.jar

java –cp target/Samsung.jar com.samsung.project.App

# **22-02-2019**

tar and rpm?

rpm allows to install one and only one version in the system.

Build and release

Compile

Test

Package

V1 XQA

V2 XManual Testing

V3

Jar –tvf Samsung.war

-t for viewing the content war

Mvn archetype:generate 🡪 to generate Web project

1328

Group id: com.samsung.project

ArtifactId: SamsungWebApp

Version: 1.0-SNAPSHOT

Package: com.samsung.project

Java based webservers?

Apache tomcat

Jboss

WebSphere

Weblogic

Glassfish

IIS server is for .net application

How to install Tomcat?

1. Check do we have java?

java -version

1. Download the tomcat tar ball?

wget <provide the tomcat gz url>

1. Extract under /opt directory

All third part softwares will be placed under /opt directory

tar xvfz apache-tomcat-7.0.0.gz –C /opt

-C option to specify the target directory

1. Create tomcat user (non-sudo)

Useradd tomcat

Passwd tomcat

1. Setup appropriate permissions to tomcat directory

Chown –R tomcat:tomcat /opt/apache-tomcat-7.0.92

**NOTE:** Normal user can write access only in his /home directory and /tmp directory

1. Swich to tomcat user
2. Create tomcat admin user account

Cd /opt/apache-tomcat-x.x.x/conf

Cp tomcat-user.xml tomcat-user.xml.bak

NOTE: Always take backup files before modifying it

Vi tomcat-users.xml

<tomcat-users>

<role rolename=”manager-gui”/>

<user username=”tomcatmgr” password=”tomcatmgr” roles=”manager-gui”/>

</tomcat-users>

**NOTE:** Random password generation command

#openssl rand –base64 12

1. Start tomcat service

Cd /opt/apache-tomcatx.x/bin

./startup.sh

./shutdown.sh

Check the process using

ps –ef | grep tomcat

sudo netstat –ntpl

1. Home work

Set up the tomcat with startup scripts

Systemctl start tomcat.service

Systemctl stop tomcat.service

Above commands won’t work , we need to set up

Write a shell scrip to setup the tomcat server?

Write cookbook to setup a tomcat server?

Bash script to install tomcat?

1. Open the browser

<http://ip>: 8080/

clieck manger app and login

copy the war file to /tmp directory

provide the war location /tmp/Samsung.war

# 25-02-2019

Su – tomcat

Cd /opt/apache-tomcat-7.0.45/bin

What are different types we can use to install a application on tomcat?

Taregt dir: /opt/tomcat-x.x/webapps 🡪dir

1. Server type (/tmp/Sanasung.war)
2. Client method
3. Direct method
4. Using bash script

Download gitbucket.war to /tmp directory

Login to git bucket ui using root/root user name and password

And create a user with name devops

Again login with the new user devops to git ui

Create a new repository from git ui SamsungWebApp

Need to push the SamsungWebApp source code to

Go to the web app source folder

Cd /SamsungWebApp

Git init

Git remote add origin

Git add .

Git commit –m “”

Git push

CI/CD tools TeamCity , Bamboo , Jenkins,Hudson

# JENKINS

1. It is CI/CD tool based on java
2. It supports 1000+ plugins
3. It is the popular tools
4. Its free and opensource
5. Its supports projects in different languages

Php

Ruby

Python

C++

Java

Shell scripting

# How to interact with Jenkins?

UI

CLI

## How to install Jenkins?

Download Jenkins.war and upload on top of tomcat

<https://jenkins.io/download/>

in production we use rpm installation

$rpm –qa to check installed package

$yum list | grep Jenkins

manually download the rpm using wget and install

cd /tmp

$wget <http://mirrors.jenkins.io/war-stable/latest/jenkins.war>

Need to swich to tomacat to copy the war in webapps folder

Cp /tmp/Jenkins.war /opt/apache-tomcat-7.0.92/webapps

* Open the jeniks ui by right clicking on the tomcat ui project
* Read the instructions on the screen and use the password

Select the customized plugins and install the plugins

* It will request to create admin user.

You will see the Jenkins Dashboard

## Manage Jenkins Tab

General Configuration

Security

Global Tools

Plugin

User Management ..etc

How to do a plugin management?

1. Automatic plugin installation
2. Manual Plugin installation

What is a JOB under Jenkins ?

It is an activity which need to be performed.

Either compile, test and/or package

OR you can combine all these activities together this is called as a JOB.

What are different types of JOBS?

Type Suitable For

FreeStyle Shell, python, ruby, java

Maven Java

Pipeline one job is connected to together job to perform series of action. This is called pipeline. You can connect as many as different types of jobs together.

J1 🡪 J2 🡪 J3

Multi Pipeline

J1🡪j2🡪j3

Ja🡪Jb🡪jc

Go to Managed Jenkins 🡪 see the general configuration

Click on Legeng to see differn status of different types

Go to admin profile see the information

# **26-02-2019**

Install Plugins

Go to Managed Jenkins 🡪 Manage Plugins🡪 Available 🡪 Search

are search and install

## How to get the plugin manually?

1. Search for Jenkins plugins

.hpi (dot hpi format) Hudson plugins

.jpi(Jenkins plugin)

1. Upload it

It will automatically search for other dependencies and download it.

Manage Jenkins 🡪 Manage Plugins 🡪 Advance

Search for Mantis Jenkins Plugin (bug tracking plugin if Jenkins job fails it raises a ticket and assign it to the developer)

<https://wiki.jenkins.io/> 🡪 plugin details

<https://plugins.jenkins.io/> 🡪 plugin downloads

Where are Jenkins logs?

/opt/apache-tomcat-x.x.x/logs

How to get the global tools?

Manage Jenkins🡪 Global Tools Configuration 🡪 Maven

Job

Name

Type

Git

Maven

Build

Post-build

Email

Trigger 🡪 to start a Jenkins job we can configure this as manual ,automatic

Create new jobs with freestyle type using New Item

Trigger the job

See the console

Jenkins Home Dir : /home/tomcat/.jenkins

Manage Jenkins 🡪 Configure System 🡪 Home Directory

JENKINS\_HOME=/home/tomcat/.jenkins

This path is used to save all the Jenkins data.

Another Failure Job

New item 🡪 free style 🡪 build 🡪 clearrrr

## Create Maven Job?

New Item 🡪name: Samsungwebapp-compile🡪 maven project 🡪

General tab 🡪

Git Bucket ; provide git URL

In SCM : slect git

Repostitory URL : same url as above git url

Credentials: add

Create a maven testing job

Clone the compile job using coy option in new item

Colne the compile job using copy option and create package job

Prepare pipe line of compile test package jobs by using

Check build after other project are build trigger

Click to create a new view to segregate the jobs for different projects

To see pipeline job details :

Install manage Jenkins plugins 🡪 search for build pipeline

To new view 🡪 now we can see build pipeline view

Select that option and select the first job in the pipe line

# 27-02-2019

Start tomcat

./starup.sh

## How to integrate Tomcat with Jenkins?

* Create a user under tomcat
* Update the user information under Jenkins
* Check it

Cd /opt/apache-tomcat-7.0.99/conf

Vi tomcat-users.xml

Back up the file before updating

<tomcat-users>

<role rolename=”manager-script”/>

<user username=”deploy” password=”deploy” roles=”manager-script”/>

</tomcat-users>

Go Manage Plugins 🡪 deploy to container plugin for tomcat

Restart the tomcat

/opt/tomcat/bin/shutdown.sh

Homework :

Setup

Systemctl start tomcat.service

Systemctl stop tomcat.service

Systemctl enable tomcat.service

Check the tomcat service:

Ps –ef|grep tomcat

Netstat –ntpl

## We need to update package job to deploy to the tomcat

Need to go to post-build Actions

Select deploy war/ear to a container

Run the Jenkins job to deploy the package on tomcat

## How to integrate GIT and Jenkins?

### Get the token from the Jenkins server

Go to Jenkins user settings🡪Configure 🡪 API Token

Samsungproject as token name and Generate

Copy the string

Save it

* Put the token to the git server

Login to git

Go to the project

Settings

Servicehooks tab

URL :https://192.168.100.117:8080/Jenkins/gitbucket-webhook/ 🡪 Test Hook

Keep the token in security token field

Trigger webhook as push

Done

* Integrate it

Go to compile job 🡪Build Triggers🡪 build when a change is pushed to Gitbucket

save

* Check it

## Integrate Email system with the Jenkins?

Different email systems:

Exchange

Postfix

Zimbra

Sendmail

Gmail

Mange Jenkins 🡪 Configure System 🡪 go to Email Notification

In SMTP : smtp.gmail.com

Click on advance

Use SMTP Authentication

Enter gmail details

Use SSL

Port: 465

Reply to address

Test email recipients:…

Gmail settings:

Security 🡪 enable allow less secure apps : ON

Go to compile job and Build settings🡪 Email notifications

# **28-02-2019**

Start tomcat server

## **Jenkins CLI**

1. Java based 🡪 legacy purpose
2. SSH method 🡪 more secure

Login to Jenkins

Manage Jenkins 🡪 Jenkins CLI

Download the cli jar from the Jenkins ui

Enabling CLI option

Manage Jenkins 🡪 Configure Global Security

Manage Jenkins 🡪 Jenkins CLI

Mkdir Jenkins-remote

Cd Jenkins-remote

Wget <cli jar path>

ls –lh

-h human readable format

Java –jar Jenkins-cli.jar –s

Vi remote.sh

#!/bin/bash

#to run the Jenkins over cli option

Java –jar Jenkins-cli.jar –s <http://192.168.100.117:8080/jenkins> -auth devops:devops $1 $2 $3

:wq

./remote.sh list-jobs

./remote.sh delete-job Samsung-compile(job name)

This is not preferred way so Disable cli, we will use ssh method.

## SSH Method

Need to open another port 2222 to work with Jenkins ssh

Configure Global Security

SSH Server option keep port and save

Netstat –ntlp to know the free ports

Ssh-keygen <enter>

To generate pulic and private keys

Ls –ltr ~/.ssh/

Transfer the public key to the Jenkins server

Cat ~/.ssh/id\_rsa.pub

Copy and paste the ep on the Jenkins server UI

User profile 🡪 Configure 🡪paste key at SSH piulbi keys options field

Save the config

#ssh 192.168.100.117 –p 2222 list-jobs

Vi ssh-remote.sh

#Jenkins over SSH

Ssh –I ~/.ssh/id\_rs 192.168.100.117 –p 2222 $1 $2 $3

#./ssh-remote.sh list-jobs

Home Work

1. Create job using remoting option?

Jenkins User Management:

1. Create user

Users : Developer

Tester

Manager

1. Give specific access

For access need to install a plugin name Role based authorization strategy

MJ 🡪 Configure Global Security 🡪 enable role based strategy

Save

We can see Manage and Assign Roles

Go inside User Management and create 3 users developer,tester,manager

Create roles

Managed Jenkins 🡪 Manage and Assign Roles

2 types of roles

Global role

Add employee role provide read only permission

In the view column provide all access

Apply and save

Project role

Add developer-role

Pattern Samsung.\* only project related to Samsung can viewed by this user

Give access all the access

Add tester-role

Pattern desing.\*

Give all the access for the tester-role

Assign the Roles

Global Roles

Developer add

Tester add

Manager add

Added these in employee role

Item Roles

Add developer assing developer role

Tester assing tester role

Manager assing both the roles

Login with developer user to Jenkins ui ad see only Samsung job can be visible

Login with tester user no jobs can be view because we don’t have job with design

Login with manager user , now we need to view the jobs

How to take Bakcup of Jenkin?

Manage plugin 🡪 backup plugin

Manage Jenkins 🡪 Backup manager

Setup

Provide where to copy back up file

Click on the back Hudson configuration

# 01-03-2019

## VAGRANT

Centos7.iso 🡪 VM

Vagrant images 🡪 vagrant tool 🡪 VM

Automation

Shell script

Chef

Ansible

Puppet

It is used for development /testing environments only, not for production environments

Specify vagrant config details in vagrant file

Download Vagrant

punch line “Development Environments Made Easy”

Vagrant images we call as boxes , extension is .box

Downlaod Windows version Vagrant and install

Open commnd promprt

C:/>vagrant –version

C:/> mkdir SamsungProject

Cd SamsungProject

C:/>git init

C:/>vagrant init

Open vagrantfile

Copy the image file name from the vagrant image

#it will setup a VM with 1 CPU , 512 MB RAM

#Network settings NAT/Bridge ,Static/Dynamic IP

#By default network is NAT network

#IP,Mask,GW,DNS

#it will automatically have user vagrant/vagrant

#it will setup keybase, password less auth

#it has no firewall

#SEinux is disabled

#This coustomized ,stripped down version of app/os

#IT has facility to run the shell ,chef,ansible ,puppet

Refect [www.vagrantup.com/docs](http://www.vagrantup.com/docs)

C:\SamsunProject>vagrant up

It will automatically download the centos box

This will start a new VMcheck virtual box

From windows command prompt we can control the above created VM

C:/>vagrant suspend

C:/>vagrant resume

We should be in the project directory to control the vm

C:/>vagrant ssh

We are inside the VM

$whoami

Exit

C:/samsungproject> vagrant halt

C:/Samsung>vagrant destroy

To start a windows VM

C:/samsungProject>vagrant rdp

mkdir vagrant-nginx

cd vagrant-nginx

vagrant up

customer

Load Balancer

Web1 Web2

Ubuntu,nginx

C:/varrant –nginx>vagrant status

C:/>vagrant up

Vagrant port lb1

NOTE: terraform is for cloud , vagrant is for local machines

Note: We can integrate Vagrant and Jenkins

# **04-03-2019**

## DOCKER

Containerization

Thin Virtualization

What is virtualization?

1. No hardware
2. CPU and memory are shared
3. Logical Separation virtual machines

Advantage:

1. Easy to backup

2. Easy to replicate

3. Easy to modify

Download docker from docker.com

Download Docker Engine

**Note: For docker installation ,Refer docker docs for cento os**

1. Install base packages

Sudo yum install –y yum-utils \

Device-mapper-persistent-data\

Lvm2

1. Install the docker repo

Sudo yum-config-manager \

Actual docker installation

Sudo yum install docker-ce docker-ce-cli containerd.io

1. Start docker service

Systemctl start docker.service

.iso – manual 🡪 VM

.box – vagrant 🡪 VM

.img – docker 🡪 Containers

$rpm –qa |grep docker

$sudo docker images

Sudo docker rmi nginx

<http://hub.docker.com>

to know the images

to install centos image

docker pull centos

to know how many comtainers are running?

$sudo docker ps

What is command to start container?

#this is testing mode for running container

#This is attached mode

Sudo Docker run -ti --rm <imagename> <command>

-t terminal

-i interative

--rm destroy container once it tops

Container is an application

$sudo docker run -ti --rm centos /bin/bash

One container is running

To start Ubuntu cintaner

Sudo docker run –ti –rm Ubuntu /bin/bash

Cat /etc/os-release to know the OS information