EXPERIMENT No: 11

Aim: To learn Software Configuration Management and provisioning using Puppet Blocks (Manifest, Modules, Classes, Function)

Date of Performance: **Date of Submission:**

CONTENTS

- **What is Puppet?**
- **How does Puppet work?**
- **Installing Puppet agent**
- **Configuration Management**
- **What are the Puppet Menifest files?**

THEORY

Step 01: Generate a root and intermediate signing CA for Puppet Server.

```
sudo /opt/puppetlabs/bin/puppetserver ca setup
```

```
saloni01@puppet-server:~$ sudo /opt/puppetlabs/bin/puppetserver ca setup
Generation succeeded. Find your files in /etc/puppetlabs/puppet/ssl/ca
```

Step 02: Enable the puppet server. Enable and Start puppetserver service.

```
sudo systemctl enable puppetserver
```

```
saloni01@puppet-server:~$  sudo systemctl enable puppetserver
Synchronizing state of puppetserver.service with SysV service script with /lib/sy
stemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable puppetserver
saloni01@puppet-server:~$ sudo systemctl start puppetserver
saloni01@puppet-server:~$
```

```
systemctl start puppetserver
```

Check the status of the puppet server service using, **sudo systemctl status puppetserver.service**

```
saloni01@puppet-server:~$  sudo systemctl status puppetserver.service
● puppetserver.service - puppetserver Service
   Loaded: loaded (/lib/systemd/system/puppetserver.service; enabled; vendor pres
   Active: active (running) since Sat 2020-05-16 18:56:13 IST; 1min 6s ago
  Process: 6575 ExecStart=/opt/puppetlabs/server/apps/puppetserver/bin/puppetserv
 Main PID: 6584 (java)
    Tasks: 39 (limit: 4915)
   CGroup: /system.slice/puppetserver.service
           └─6584 /usr/bin/java -Xms512m -Xmx512m -Djruby.logger.class=com.puppet

May 16 18:55:06 puppet-server.saloni.com systemd[1]: Starting puppetserver Servic
May 16 18:56:13 puppet-server.saloni.com systemd[1]: Started puppetserver Service
lines 1-11/11 (END)
```

Step 03: Create a Puppet Manifest

We will be creating a Puppet Manifest file to install the Apache server on the Puppet client Create a folder path for the Nginx class:

```
sudo mkdir -p /etc/puppetlabs/code/modules/nginx/manifests/
```

The modules directory will host all our modules. Then create nginx resource by creating a file:

```
sudo gedit /etc/puppetlabs/code/modules/nginx/manifests/init.pp
```

And add the following code,

```
class nginx { package { 'nginx':
ensure => installed,
} service { 'nginx': ensure => true, enable
=> true, require => Package['nginx'],
}
}
```

Next, create a node file for our client agent-1.priya.com:

```
sudo gedit /etc/puppetlabs/code/modules/nginx/manifests/site.pp
```

Then add the following content to the file,

```
saloni01@puppet-server:~$ sudo ls /etc/puppetlabs/code/modules/nginx/manifests/
init.pp  site.pp
```

Step 04: Install Puppet Agent on the slave machine. The Puppet repository has already been set up on the node in Step 01. The hosts file has also been edited to have all the required addresses. Now, we have to install the Puppet Agent on the node using the command,

```
saloni077@agent-1:~$ sudo apt-get install puppet-agent
[sudo] password for saloni077:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  puppet-agent
0 upgraded, 1 newly installed, 0 to remove and 179 not upgraded.
Need to get 22.8 MB of archives.
After this operation, 134 MB of additional disk space will be used.
Get:1 http://apt.puppetlabs.com bionic/puppet6 amd64 puppet-agent amd64 6.15.0-
1bionic [22.8 MB]
Fetched 22.8 MB in 31s (736 kB/s)
```

```
sudo apt-get install puppet-agent
```

Puppet agent also uses some of the default settings to connect to the master node. But, we need to edit the puppet configuration file and set puppet master information using the command

```
sudo nano /etc/puppetlabs/puppet/puppet.conf
```

```
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3          /etc/puppetlabs/puppet/puppet.conf

# This file can be used to override the default puppet settings.
# See the following links for more details on what settings are available:
# - https://puppet.com/docs/puppet/latest/config_important_settings.html
# - https://puppet.com/docs/puppet/latest/config_about_settings.html
# - https://puppet.com/docs/puppet/latest/config_file_main.html
# - https://puppet.com/docs/puppet/latest/configuration.html

[main]
certname = agent-1.saloni.com
server = puppet-server.saloni.com
environment = production
runinterval = 15m
```

Start puppet agent on the node and make it start automatically on system boot by using the following command

```
sudo /opt/puppetlabs/bin/puppet resource service puppet ensure=running
enable=true
```

```
saloni077@agent-1:~$ sudo /opt/puppetlabs/bin/puppet resource service puppet en
sure=running enable=true
Notice: /Service[puppet]/ensure: ensure changed 'stopped' to 'running'
service { 'puppet':
  ensure   => 'running',
  enable   => 'true',
  provider => 'systemd',
}
saloni077@agent-1:~$
```

Step 05: Sign Agent Node Certificate on Master Server

In an agent/master deployment, an admin must approve a certificate request for each agent node before that node can fetch configurations. Agent nodes will request certificates for the first time they attempt to run.

Log into the **puppet master server** and run below command to view outstanding requests.

```
sudo /opt/puppetlabs/bin/puppetserver ca list
```

```
saloni01@puppet-server:~$ sudo /opt/puppetlabs/bin/puppetserver ca list
Requested Certificates:
    agent-1.saloni.com       (SHA256)  DE:91:08:16:EA:7F:8A:1E:45:C8:5C:14:50:B1:4A
:36:C4:FB:29:6A:C5:76:A3:DA:90:CB:4A:1A:23:BA:EF:7F
```

Sign the certificate using the following command,

```
saloni01@puppet-server:~$ sudo /opt/puppetlabs/bin/puppetserver ca sign --certname
agent-1.saloni.com
Successfully signed certificate request for agent-1.saloni.com
```

```
sudo /opt/puppetlabs/bin/puppetserver ca sign --certname agent-
1.priya.com
```

Now, to list all of the signed and unsigned requests, we should run on the master server.

```
saloni01@puppet-server:~$ sudo /opt/puppetlabs/bin/puppetserver ca list --all
Signed Certificates:
    puppet-server.saloni.com       (SHA256)  C8:10:8A:63:E5:3C:F6:5E:C5:5C:E6:72:AE
:A5:39:49:91:54:84:A9:12:AB:D6:E0:7B:1E:50:E6:F4:AE:C2:D9       alt names: ["DNS:pu
ppet-server.saloni.com", "DNS:puppet-server.saloni.com", "DNS:server"]  authorizati
on extensions: [pp_cli_auth: true]
    agent-1.saloni.com             (SHA256)  F9:32:8B:18:9A:29:57:A7:86:2B:D2:65:72
:0C:B8:C2:8A:50:93:5A:4D:EC:E7:EA:FC:75:EE:D0:5D:6B:AE:28
```

```
sudo /opt/puppetlabs/bin/puppetserver ca list --all
```

Step 06: Verifying the Puppet Agent

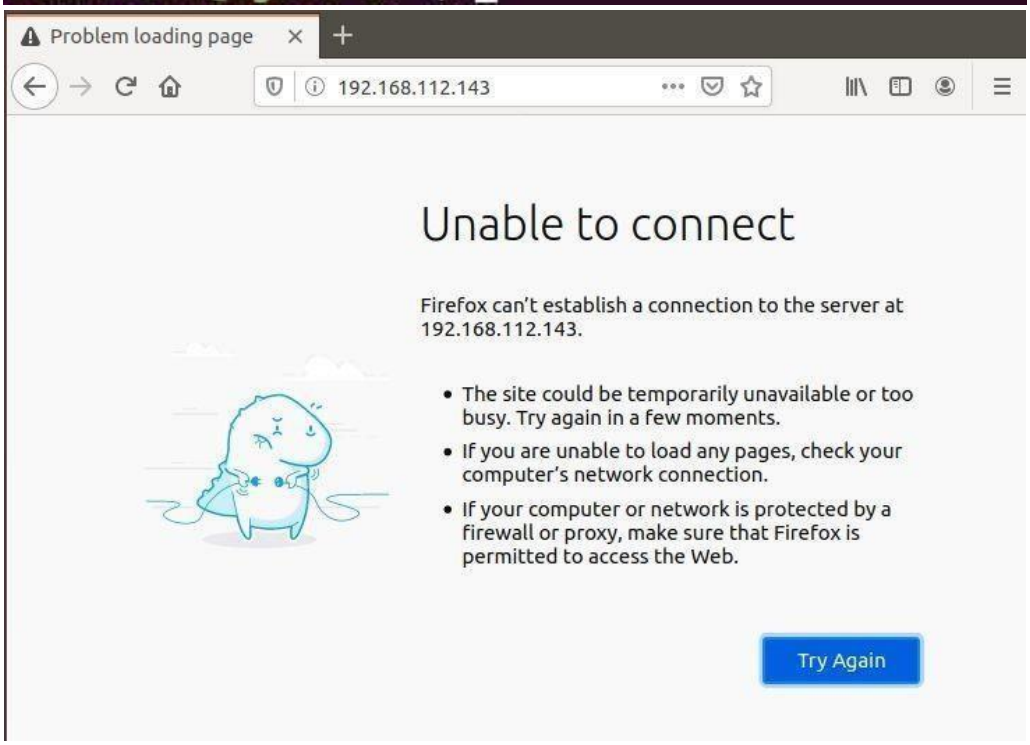
Once the Puppet master has signed your client certificate, run the following command on the client machine to test it.

```
saloni077@agent-1:~$ sudo /opt/puppetlabs/bin/puppet agent --test
Info: Using configured environment 'production'
Info: Retrieving pluginfacts
Info: Retrieving plugin
Info: Retrieving locales
Info: Caching catalog for agent-1.saloni.com
Info: Applying configuration version '1589636776'
Notice: Applied catalog in 0.02 seconds
```

```
Sudo /opt/puppetlabs/bin/puppet agent --test
```

Step 7: Installing the Apache server on the client(agent). We have already created the manifest file to install the Apache server on the client. Now, we run that manifest file. So first, we check if Apache is already present on the client-side, if yes then we remove it completely.

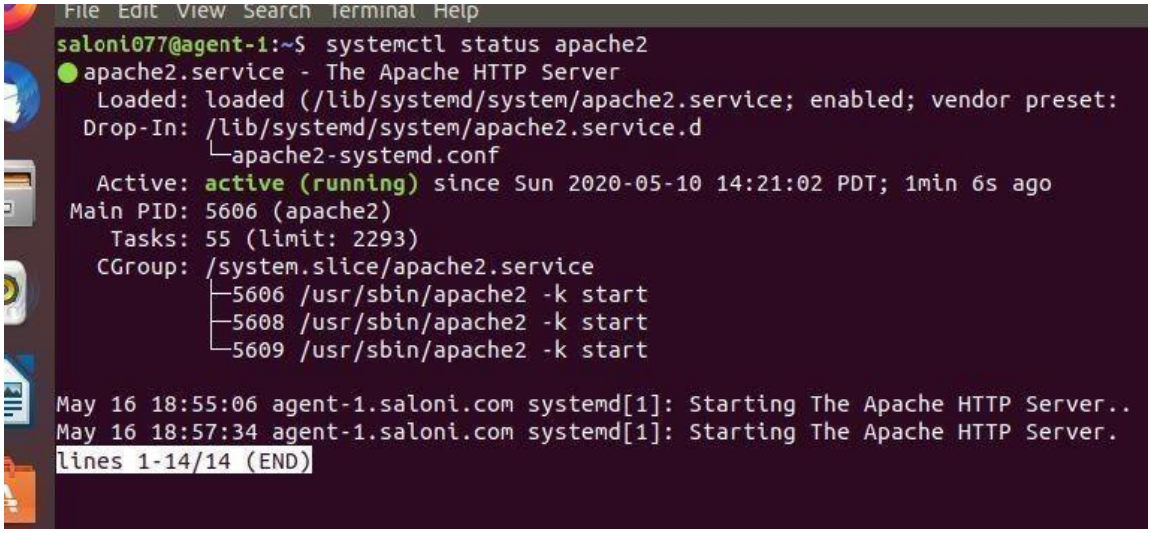
```
saloni077@agent-1:~$ systemctl status apache2
Unit apache2.service could not be found.
saloni077@agent-1:~$
```



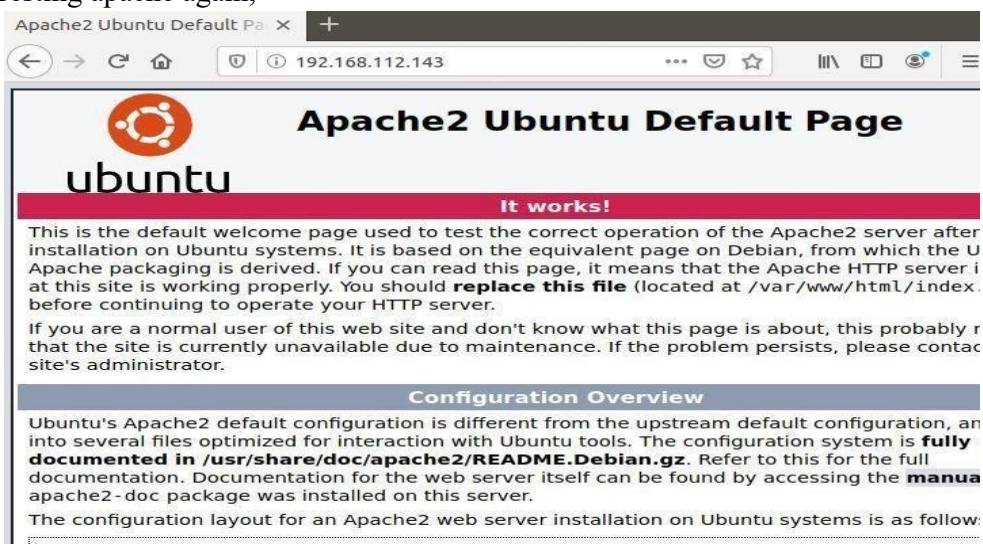
Now either wait for 15 minutes or run it on the agent side using the commands as shown.

```
saloni077@agent-1:~$ sudo /opt/puppetlabs/bin/puppet agent --test
Info: Using configured environment 'production'
Info: Retrieving pluginfacts
Info: Retrieving plugin
Info: Retrieving locales
Info: Caching catalog for agent-1.priya.com
Info: Applying configuration version '1589145631'
Notice: /Stage[main]/Apache/Package[apache2]/ensure: created
Notice: Applied catalog in 45.16 seconds
```

```
Sudo /opt/puppetlabs/bin/puppet agent --test
```



Testing apache again,



Conclusion: