

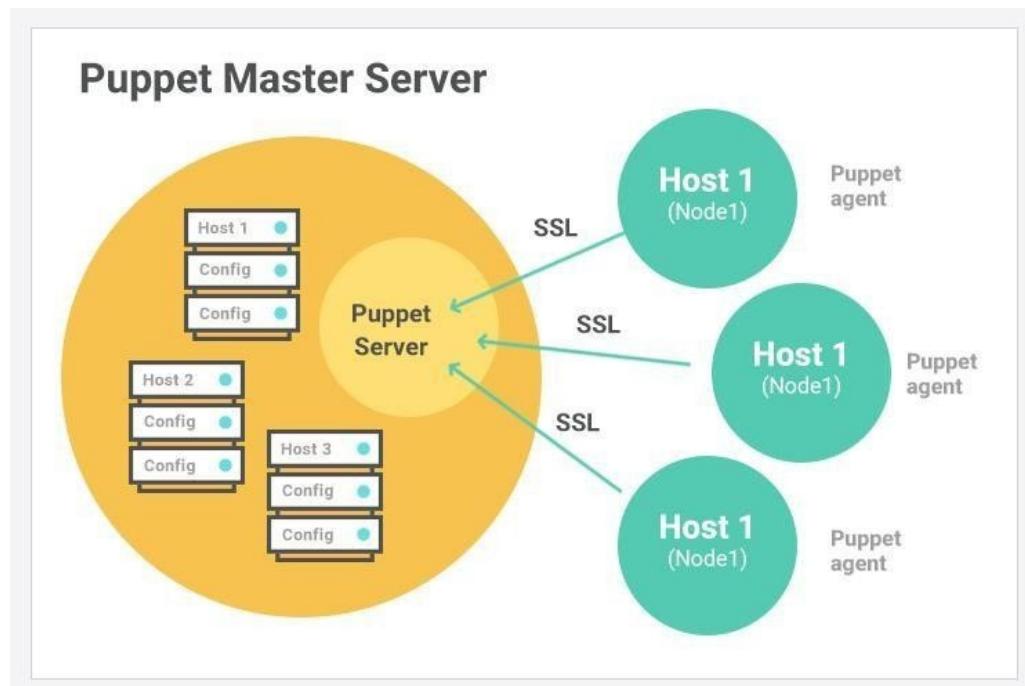
Semester	Semester VIII
Subject	Devops Lab
Subject Professor In-charge	Prof. Yash Shah
Student Name	Ashwini Jadhav
Roll Number	17101B0038
Grade and Subject Teacher's Signature	

Experiment Number	7	
Experiment Title	Writing first code in puppet	
Resources / Apparatus Required	Hardware: Compatible Computer System	Kali Linux
Objectives	To understand the concept of software configuration management	
Theory	<p>What is Configuration Management?</p> <p>Configuration management is the process of maintaining and establishing the performance of the products by maintaining its physical attributes, functional attributes, design, requirements, and operational information throughout its lifecycle.</p> <p>The system administrators who will manually install, deploy, and configure a variety of servers and devices for the applications to run, this is a repetitive task, highly complex, and prone to errors.</p> <p>In this scenario, we need to automate the process of configuring a variety of servers and devices and thus make the system's configuration faster, less error-prone, and to do it easily with some simple methods.</p> <p>As you see there are tools such as Puppet, Ansible, Chef. They are the tools for configuration management of systems and are used extensively in the DevOps environment.</p> <p>What is Puppet in DevOps?</p> <p>The puppet is a system management tool that helps in automating and centralizing the configuration management process. It also used for software deployment. It is available in open source and commercial versions.</p>	

It helps in servers' configuration management, servers' deployments, and orchestrations of various applications across a whole lot of infrastructure in the organization.

Imagine you have 100 servers, it is not possible to maintain, manage and configure the servers manually, Puppet performs the following,

- Puppet allows us to do separate configurations for every host
- It continuously monitors the server for the configurations and if the configurations are altered it automatically changes to a pre-defined configuration on the hosts.
- It has control over a whole lot of infrastructure so that the centralized configurations get effected in each of the infrastructures
- It is also used as an automatic deployment tool for all the applications on the servers.
- It implements Infrastructure as a Code, the policies and configurations are written as a code



Output**MASTER**

Creating master container

```
root@kali:~# docker run -it -d --name Master ubuntu  
ee88f908b72be10cce862fcc2574a3797c75220bafde74560c462da067cfb334
```

Going inside the master container

```
root@kali:~# docker exec -it ee88f908b72b bash  
root@ee88f908b72b:/# █
```

Updating the master container

```
root@ee88f908b72b:/# apt update  
Get:1 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]  
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [109 kB]  
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]  
Get:4 http://archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]  
Get:5 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages  
[197 kB]  
Get:6 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [177 kB]  
Get:7 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]  
Get:8 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [718  
kB]  
Get:9 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [  
682 kB]  
Get:10 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Package  
s [21.6 kB]  
Get:11 http://archive.ubuntu.com/ubuntu focal/restricted amd64 Packages [33.4 kB  
]  
Get:12 http://archive.ubuntu.com/ubuntu focal/main amd64 Packages [1275 kB]  
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [9  
49 kB]  
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages  
[29.6 kB]  
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1130  
kB]  
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages  
[229 kB]  
Get:17 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages  
[4305 B]  
Fetched 17.4 MB in 29s (608 kB/s)  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done
```

Installing nano

```
root@ee88f908b72b:/# apt install nano
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  hunspell
The following NEW packages will be installed:
  nano
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 269 kB of archives.
After this operation, 868 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 nano amd64 4.8-1ubuntu1 [269 kB]
Fetched 269 kB in 1s (294 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package nano.
(Reading database ... 4121 files and directories currently installed.)
Preparing to unpack .../nano_4.8-1ubuntu1_amd64.deb ...
Unpacking nano (4.8-1ubuntu1) ...
Setting up nano (4.8-1ubuntu1) ...
update-alternatives: using /bin/nano to provide /usr/bin/editor (editor) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/editor.1.gz because associated file /usr/share/man/man1/nano.1.gz (of link group editor) does n't exist
update-alternatives: using /bin/nano to provide /usr/bin/pico (pico) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/pico.1.gz because associated file /usr/share/man/man1/nano.1.gz (of link group pico) doesn't exist
```

Installing wget

```
root@ee88f908b72b:/# apt install wget
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix
The following NEW packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix wget
0 upgraded, 6 newly installed, 0 to remove and 6 not upgraded.
Need to get 2598 kB of archives.
After this operation, 7225 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssl1.1 amd64 1.1.1f-1ubuntu2.3 [1320 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 openssl amd64 1.1.1f-1ubuntu2.3 [620 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 ca-certificates all 20210119-20.04.1 [146 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/main amd64 libpsl5 amd64 0.21.0-1ubuntu1 [51.5 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 publicsuffix all 20200303.0012-1 [111 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/main amd64 wget amd64 1.20.3-1ubuntu1 [349 kB]
Fetched 2598 kB in 5s (544 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package libssl1.1:amd64.
(Reading database ... 4188 files and directories currently installed.)
Preparing to unpack .../0-libssl1.1_1.1.1f-1ubuntu2.3_amd64.deb ...
Unpacking libssl1.1:amd64 (1.1.1f-1ubuntu2.3) ...
Selecting previously unselected package openssl.
```

Going to apt.puppetlabs.com

Index of /			
Name	Last modified	Size	Description
Parent Directory			-
DEB-GPG-KEY-puppet	2016-10-06 11:23:49	1.6KB	
DEB-GPG-KEY-puppet-20250406	2021-02-04 10:24:09	1.7KB	
DEB-GPG-KEY-puppetlabs	2016-09-08 16:11:43	4.6KB	
DEB-GPG-KEY-reductive	2016-09-08 16:11:43	2.7KB	
README.txt	2019-08-08 17:05:58	981.0B	
dists/	2021-04-07 13:01:37	4.0KB	
eo1-releases/	2020-08-27 11:15:14	4.0KB	
keyring.gpg	2021-04-07 13:01:37	4.5KB	
pool/	2021-04-07 12:56:52	4.0KB	
pubkey.gpg	2021-04-07 13:01:37	6.1KB	
puppet-release-bionic.deb	2020-11-19 11:17:37	11.5KB	
puppet-release-buster.deb	2020-11-19 11:17:38	11.5KB	
puppet-release-focal.deb	2020-11-19 11:17:40	11.5KB	
puppet-release-stretch.deb	2020-11-19 11:17:42	11.4KB	
puppet-release-xenial.deb	2020-11-19 11:17:35	11.4KB	
puppet-tools-release-bionic.deb	2021-01-12 14:13:51	11.5KB	
puppet-tools-release-buster.deb	2021-01-12 14:13:44	11.5KB	
puppet-tools-release-focal.deb	2021-01-12 14:13:49	11.5KB	
puppet-tools-release-jessie.deb	2021-01-12 14:13:48	11.5KB	
puppet-tools-release-stretch.deb	2021-01-12 14:13:45	11.4KB	
puppet-tools-release-trusty.deb	2021-01-12 14:13:47	11.4KB	
puppet-tools-release-xenial.deb	2021-01-12 14:13:43	11.4KB	
puppet6-release-bionic.deb	2021-02-04 13:39:49	11.5KB	

Downloading file puppet-release-bionic-deb

```
root@ee88f908b72b:/# wget http://apt.puppetlabs.com/puppet-release-bionic.deb
-- 2021-04-10 10:24:13 -- http://apt.puppetlabs.com/puppet-release-bionic.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com) ... 13.35.239.90, 2600:9000:208
5:2800:id:fc37:icc0:93a1, 2600:9000:2085:1200:id:fc37:icc0:93a1, ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|13.35.239.90|:80 ... connected.
HTTP request sent, awaiting response ... 200 OK 11:15:14 4.0KB
Length: 11736 (11K) [application/x-debian-package]
Saving to: 'puppet-release-bionic.deb'

puppet-release-bion 100%[=====] 11.46K -- --KB/s   in 0.01s

2021-04-10 10:24:13 (860 KB/s) - 'puppet-release-bionic.deb' saved [11736/11736]
```

Installing net tools

```
root@ee88f908b72b:/# apt install net-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 196 kB of archives.
After this operation, 864 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 net-tools amd64 1.60+git
20180626.aebd88e-1ubuntui [196 kB]
Fetched 196 kB in 1s (193 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package net-tools.
(Reading database ... 4532 files and directories currently installed.)
Preparing to unpack ... /net-tools_1.60+git20180626.aebd88e-1ubuntui_amd64.deb ...
Unpacking net-tools (1.60+git20180626.aebd88e-1ubuntui) ...
Setting up net-tools (1.60+git20180626.aebd88e-1ubuntui) ...
```

Extracting the downloaded file

```
root@ee88f908b72b:/# dpkg -i puppet-release-bionic.deb
Selecting previously unselected package puppet-release.
(Reading database ... 4581 files and directories currently installed.)
Preparing to unpack puppet-release-bionic.deb ...
Unpacking puppet-release (1.0.0-14bionic) ...
Setting up puppet-release (1.0.0-14bionic) ...
```

Installing puppetmaster

```
root@ee88f908b72b:/# apt install puppetmaster
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  augeas-lenses debconf-utils distro-info-data facter file fonts-lato hiera
  javascript-common krb5-locales libasn1-8-heimdal libaugeas0
  libboost-filesystem1.71.0 libboost-locale1.71.0 libboost-log1.71.0
  libboost-program-options1.71.0 libboost-regex1.71.0 libboost-thread1.71.0
  libbrotli1 libcpp-hocon0.1.7 libcurl4 libexpat1 libfacter3.11.0
  libgdbm-compat4 libgdbm6 libgssapi-krb5-2 libgssapi3-heimdal
  libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal
  libhx509-5-heimdal libicu66 libjs-jquery libk5crypto3 libkeyutils1
  libkrb5-26-heimdal libkrb5-3 libkrb5support0 libldap-2.4-2 libldap-common
  libleatherman1.4.2 libmagic-mgc libmagic1 libmpdec2 libnghttp2-14
  libpython3-stdlib libpython3.8-minimal libpython3.8-stdlib libreadline8
  libroken18-heimdal librtmp1 libruby2.7 libsasl2-2 libsasl2-modules
  libsasl2-modules-db libsqlite3-0 libssh-4 libwind0-heimdal libxml2
  libyaml-0-2 libyaml-cpp0.6 lsb-release mime-support puppet puppet-master
  python3 python3-minimal python3.8 python3.8-minimal rake readline-common
  ruby ruby-augeas ruby-deep-merge ruby-minitest ruby-net-telnet
  ruby-power-assert ruby-selinux ruby-shadow ruby-sync ruby-test-unit
  ruby-xmlrpc ruby2.7 rubygems-integration tzdata unzip xz-utils zip
Suggested packages:
  augeas-doc mcollective-common puppet-common apache2 | lighttpd | httpd
  augeas-tools gdm3 krb5-doc krb5-user libsasl2-modules-gssapi-mit
  | libsasl2-modules-gssapi-heimdal libsasl2-modules-ldap libsasl2-modules-otp
  libsasl2-modules-sql ruby-rrd ruby-hocon python3-doc python3-tk python3-venv
  python3.8-venv python3.8-doc binutils binfmt-support readline-doc ri
  ruby-dev bundler
```

Installing systemctl

```
root@ee88f908b72b:/# apt install systemctl
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  tini | dumb-init
The following NEW packages will be installed:
  systemctl
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 75.5 kB of archives.
After this operation, 275 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/universe amd64 systemctl all 1.4.34
2-2 [75.5 kB] 2021-04-07 13:01:37 4.0KB
Fetched 75.5 kB in 1s (111 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package systemctl.
(Reading database ... 11414 files and directories currently installed.)
Preparing to unpack .../systemctl_1.4.3424-2_all.deb ...
Unpacking systemctl (1.4.3424-2) ...
Setting up systemctl (1.4.3424-2) ...
```

Restarting puppet-master service

```
root@ee88f908b72b:/# systemctl restart puppet-master.service
root@ee88f908b72b:/# systemctl status puppet-master.service
puppet-master.service - Puppet master
   Loaded: loaded (/usr/lib/systemd/system/puppet-master.service, enabled)
   Active: active (running)
```

Finding ip address of master

```
root@ee88f908b72b:/# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet 172.17.0.3  netmask 255.255.0.0  broadcast 172.17.255.255
          ether 02:42:ac:11:00:03  txqueuelen 0  (Ethernet)
              RX packets 27252  bytes 53420425 (53.4 MB)
              RX errors 0  dropped 0  overruns 0  frame 0
              TX packets 19360  bytes 1550879 (1.5 MB)
              TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
      inet 127.0.0.1  netmask 255.0.0.0
          loop  txqueuelen 1000  (Local Loopback)
              RX packets 0  bytes 0 (0.0 B)
              RX errors 0  dropped 0  overruns 0  frame 0
              TX packets 0  bytes 0 (0.0 B)
              TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0
```

Certificate request received by master

```
root@ee88f908b72b:/# puppet cert list
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
/usr/lib/ruby/vendor_ruby/puppet/util.rb:315: warning: deprecated Object#=~ is called on Puppet::Transaction::Report; it always returns nil
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Warning: `puppet cert` is deprecated and will be removed in a future release.
  (location: /usr/lib/ruby/vendor_ruby/puppet/application.rb:370:in `run')
  "1ed06abb0b1f.iballbatonwifi.com" (SHA256) 38:DB:A4:C3:FE:42:AC:01:74:00:F4:52
  :95:CB:DD:3E:A9:A5:47:72:7B:7A:0C:25:17:AE:02:01:C9:15:2D:F6
```

Signed all certificates

```
root@ee88f908b72b:/# puppet cert sign --all
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
/usr/lib/ruby/vendor_ruby/puppet/util.rb:315: warning: deprecated Object#=~ is called on Puppet::Transaction::Report; it always returns nil
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Warning: `puppet cert` is deprecated and will be removed in a future release.
(location: /usr/lib/ruby/vendor_ruby/puppet/application.rb:370:in `run`)
Signing Certificate Request for:
  "1ed06abb0b1f.iballbatonwifi.com" (SHA256) 38:DB:A4:C3:FE:42:AC:01:74:00:F4:52
:95:CB:DD:3E:A9:A5:47:72:7B:7A:0C:25:17:AE:02:01:C9:15:2D:F6
Notice: Signed certificate request for 1ed06abb0b1f.iballbatonwifi.com
Notice: Removing file Puppet::SSL::CertificateRequest 1ed06abb0b1f.iballbatonwifi.com at '/var/lib/puppet/ssl/ca/requests/1ed06abb0b1f.iballbatonwifi.com.pem'
```

Going inside the directory to edit the site.pp file

```
root@ee88f908b72b:/# cd /etc/puppet/code/
root@ee88f908b72b:/etc/puppet/code# ls
root@ee88f908b72b:/etc/puppet/code# mkdir environments
root@ee88f908b72b:/etc/puppet/code# cd environments/
root@ee88f908b72b:/etc/puppet/code/environments# mkdir production
root@ee88f908b72b:/etc/puppet/code/environments# cd production/
root@ee88f908b72b:/etc/puppet/code/environments/production# mkdir manifests
root@ee88f908b72b:/etc/puppet/code/environments/production# cd manifests/
root@ee88f908b72b:/etc/puppet/code/environments/production/manifests# nano site.
```

Editing site.pp file

```
GNU nano 4.8                               site.pp                                Modified
file{ '/etc/omkarshinde1.txt':
  ensure => present,
  content => "Hello omkar shinde, this has come from Master",
  mode => '0644',
}
```

SLAVE

Creating slave container

```
root@kali:~# docker run -it -d --name slave ubuntu
1ed06abb0b1fc428d6e3fd460499841c7b4a5935597de0946c9dededa75f51fe
```

Going inside the slave container

```
root@kali:~# docker exec -it 1ed06abb0b1f bash
root@1ed06abb0b1f:/# █
```

Updating the slave container

```
root@1ed06abb0b1f:/# apt update
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [109 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [682 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [21.6 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [718 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [177 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal/main amd64 Packages [1275 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [197 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]
Get:12 http://archive.ubuntu.com/ubuntu focal/restricted amd64 Packages [33.4 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [229 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [949 kB]
```

Installing nano

```
root@1ed06abb0b1f:/# apt install nano
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  hunspell
The following NEW packages will be installed:
  nano
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 269 kB of archives.
After this operation, 868 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 nano amd64 4.8-1ubuntu1 [269 kB]
Fetched 269 kB in 1s (295 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package nano.
(Reading database ... 4121 files and directories currently installed.)
Preparing to unpack ... /nano_4.8-1ubuntu1_amd64.deb ...
Unpacking nano (4.8-1ubuntu1) ...
Setting up nano (4.8-1ubuntu1) ...
update-alternatives: using /bin/nano to provide /usr/bin/editor (editor) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/editor.1.gz
because associated file /usr/share/man/man1/nano.1.gz (of link group editor) doesn't exist
update-alternatives: using /bin/nano to provide /usr/bin/pico (pico) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/pico.1.gz because associated file /usr/share/man/man1/nano.1.gz (of link group pico) doesn't exist
```

Installing wget

```
root@1ed06abb0b1f:/# apt install wget
Reading package lists... Done
Building dependency tree...
Reading state information... Done
The following additional packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix
The following NEW packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix wget
0 upgraded, 6 newly installed, 0 to remove and 6 not upgraded.
Need to get 2598 kB of archives.
After this operation, 7225 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssl1.1 amd64
  1.1.1f-1ubuntu2.3 [1320 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 openssl amd64 1
  .1.1f-1ubuntu2.3 [620 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 ca-certificates
  all 20210119~20.04.1 [146 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/main amd64 libpsl5 amd64 0.21.0-1u
  buntu1 [51.5 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 publicsuffix all 202003
  03.0012-1 [111 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/main amd64 wget amd64 1.20.3-1ubun
  tu1 [349 kB]
Fetched 2598 kB in 4s (586 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package libssl1.1:amd64.
(Reading database ... 4188 files and directories currently installed.)
Preparing to unpack .../0-libssl1.1_1.1.1f-1ubuntu2.3_amd64.deb ...
Unpacking libssl1.1:amd64 (1.1.1f-1ubuntu2.3) ...
Selecting previously unselected package openssl.
```

Downloading file puppet-release-bionic.deb

```
root@1ed06abb0b1f:/# wget http://apt.puppetlabs.com/puppet-release-bionic.deb
--2021-04-10 11:04:04--  http://apt.puppetlabs.com/puppet-release-bionic.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com) ... 13.35.239.90, 13.35.239.76
, 13.35.239.72, ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|13.35.239.90|:80 ... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11736 (11K) [application/x-debian-package]
Saving to: 'puppet-release-bionic.deb'

puppet-release-bion 100%[=====] 11.46K --KB/s    in 0.003s

2021-04-10 11:04:05 (3.21 MB/s) - 'puppet-release-bionic.deb' saved [11736/1173
6]
```

Extracting the file

```
root@1ed06abb0b1f:/# dpkg -i puppet-release-bionic.deb
Selecting previously unselected package puppet-release.
(Reading database ... 4532 files and directories currently installed.)
Preparing to unpack puppet-release-bionic.deb ...
Unpacking puppet-release (1.0.0-14bionic) ...
Setting up puppet-release (1.0.0-14bionic) ...
root@1ed06abb0b1f:/#
```

Installing puppet

```
root@1ed06abb0b1f:/# apt install puppet
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  augeas-lenses debconf-utils distro-info-data facter file fonts-lato hiera
  javascript-common krb5-locales libasn1-8-heimdal libaugeas0
  libboost-filesystem1.71.0 libboost-locale1.71.0 libboost-log1.71.0
  libboost-program-options1.71.0 libboost-regex1.71.0 libboost-thread1.71.0
  libbrotli1 libcpp-hocon0.1.7 libcurl4 libexpat1 libfacter3.11.0
  libgdbm-compat4 libgdbm6 libgssapi-krb5-2 libgssapi3-heimdal
  libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal
  libhx509-5-heimdal libicu66 libjs-jquery libk5crypto3 libkeyutils1
  libkrb5-26-heimdal libkrb5-3 libkrb5support0 libldap-2.4-2 libldap-common
  libleatherman1.4.2 libmagic-mgc libmagic1 libmpdec2 libnghttp2-14
  libpython3-stdlib libpython3.8-minimal libpython3.8-stdlib libreadline8
  libroken18-heimdal librtmp1 libruby2.7 libsasl2-2 libsasl2-modules
  libsasl2-modules-db libsqlite3-0 libssh-4 libwind0-heimdal libxml2
  libyaml-0-2 libyaml-cpp0.6 lsb-release mime-support python3 python3-minimal
  python3.8 python3.8-minimal rake readline-common ruby ruby-augeas
  ruby-deep-merge ruby-minitest ruby-net-telnet ruby-power-assert
  ruby-selinux ruby-shadow ruby-sync ruby-test-unit ruby-xmlrpc ruby2.7
  rubygems-integration tzdata unzip xz-utils zip
Suggested packages:
  augeas-doc mcollective-common puppet-common apache2 | lighttpd | httpd
  augeas-tools gdm-l10n krb5-doc krb5-user libsasl2-modules-gssapi-mit
  | libsasl2-modules-gssapi-heimdal libsasl2-modules-ldap
  libsasl2-modules-otp libsasl2-modules-sql ruby-rrd ruby-hocon python3-doc
  python3-tk python3-venv python3.8-venv python3.8-doc binutils
  binfmt-support readline-doc ri ruby-dev bundler
The following NEW packages will be installed:
  augeas-lenses debconf-utils distro-info-data facter file fonts-lato hiera
```

Going to hosts file and entering master ip address

```
GNU nano 4.8
hosts
127.0.0.1      localhost
::1      localhost ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
172.17.0.2      1ed06abb0b1f
172.17.0.3      puppet
```

Install systemctl

```
root@1ed06abb0b1f:/etc# apt install systemctl
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  tini | dumb-init
The following NEW packages will be installed:
  systemctl
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 75.5 kB of archives.
After this operation, 275 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/universe amd64 systemctl all 1.4.3
424-2 [75.5 kB]
Fetched 75.5 kB in 1s (110 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package systemctl.
(Reading database ... 11351 files and directories currently installed.)
Preparing to unpack .../systemctl_1.4.3424-2_all.deb ...
Unpacking systemctl (1.4.3424-2) ...
Setting up systemctl (1.4.3424-2) ...
```

Starting puppet using systemctl

```
root@1ed06abb0b1f:/etc# systemctl start puppet
root@1ed06abb0b1f:/etc# █
```

Sending certificate request

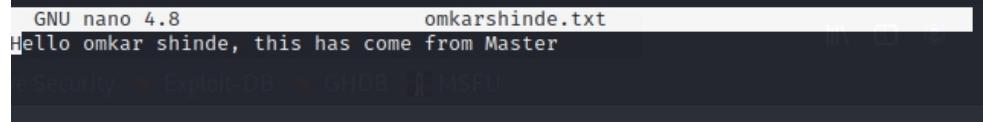
```
root@1ed06abb0b1f:/etc# puppet agent -t --debug
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Debug: Applying settings catalog for sections main, agent, ssl
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Using settings: adding file resource 'confdir': 'File[/etc/puppet]{:path
=>"/etc/puppet", :ensure=>:directory, :loglevel=>:debug, :links=>:follow, :back
up=>false}'
Debug: Using settings: adding file resource 'codedir': 'File[/etc/puppet/code]{:
path=>"/etc/puppet/code", :ensure=>:directory, :loglevel=>:debug, :links=>:fol
low, :backup=>false}'
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Failed to load library 'cfpropertylist' for feature 'cfpropertylist': ca
```

After initializing the conversation on the slave side

```
root@1ed06abb0b1f:/etc# ls
adduser.conf          host.conf      mailcap.order    rc5.d
alternatives          hostname       mime.types      rc6.d
apache2               hosts         mke2fs.conf    rcS.d
apt                  init.d        mtab             resolv.conf
bash.bashrc           inputrc       nanorc          rmt
bindresvport.blacklist issue        networks        security
ca-certificates       issue.net    nsswitch.conf  selinux
ca-certificates.conf kernel       omkarshinde.txt | shadow
cron.d               ld.so.cache   opt              shadow-
cron.daily            ld.so.conf    os-release     shells
debconf.conf          ldap          pam.conf       skel
debian_version        libaudit.conf pam.d           ssl
default               logcheck      puppet          systemd
deluser.conf          login.defs   python3        terminfo
dpkg                 logrotate.d  profile        sysctl.conf
e2scrub.conf          lsb-release  rc0.d          update-motd.d
environment          machine-id   rc1.d          wgetrc
fstab                magic        rc2.d          xattr.conf
gai.conf              magic.mime   rc3.d
group                mailcap      rc4.d
group-               rc0.d
gshadow               rc1.d
gshadow-              rc2.d
gses                 rc3.d
                     rc4.d
```

File received on the slave side successfully

```
root@1ed06abb0b1f:/etc# nano omkarshinde.txt
root@1ed06abb0b1f:/etc#
```



GNU nano 4.8 omkarshinde.txt
Hello omkar shinde, this has come from Master

Conclusion Thus, we studied how to write code in puppet and use puppet as software configuration management tool.