Semester	B.E. Semester VIII – INFT
Subject	DevOps Lab
Subject Professor In –charge	Prof. Rohit Barve

Student Name	Nupur Sawarkar	
Roll Number	18101B0030	
Grade and Subject Teacher's Signature		

Experiment Number	5	
Experiment Title	To install Puppet for software configuration management.	
Resources / Apparatus Required	Hardware: • Intel Core i3/i5/i7 Processor with Intel VT-X support. • 4 GB RAM • 500 GB Hard disks	Software: Operating systems: Ubuntu
Theory	**Puppet:** Puppet is a Configuration Management tool that is used for deploying, configuring and managing servers. It's most commonly used on Linux and Windows to pull the strings on multiple application servers at once. It performs the following functions: • Defining distinct configurations for each and every host, and continuously checking and confirming whether the required configuration is in place and is not altered (if altered Puppet will revert back to the required configuration) on the host. • Dynamic scaling-up and scaling-down of machines.	

- Providing control over all your configured machines, so a centralized (masterserver or repo-based) change gets propagated to all, automatically.

Architecture of Puppet:
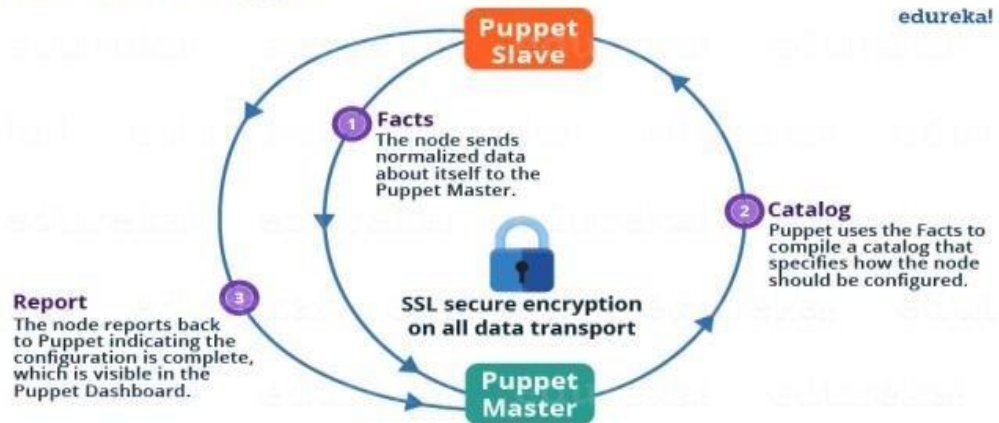
The following functions are performed in the above image:

- The Puppet Agent sends the Facts to the Puppet Master. Facts are basically key/value data pair that represents some aspect of Slave state, such as its IP address, up-time, operating system, or whether it's a virtual machine.
- Puppet Master uses the facts to compile a Catalog that defines how the Slave should be configured. Catalog is a document that describes the desired state for each resource that Puppet Master manages on a Slave. I will explain catalogs and resources in detail later.

Steps	

	Puppet Master
	
	Install wget
	
	``
	root@09e4408aeae4:/# 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 2 not upgraded.
	Need to get 2598 kB of archives.
	After this operation, 7222 kB of additional disk space will be used.
	Do you want to continue? [Y/n]
	``

wget http://apt.puppetlabs.com/puppet-release-bionic.deb

```
root@09e4408aeae4:/# wget http://apt.puppetlabs.com/puppet-release-bionic.deb
--2022-04-06 13:24:54--  http://apt.puppetlabs.com/puppet-release-bionic.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com)... 108.159.80.32, 2600:9000:238c:c200:1d:fc37:1cc0:93a1, 2600:9000:238c:9000:1d:fc37:1cc0:93a1,
...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|108.159.80.32|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11736 (11K) [application/x-debian-package]
Saving to: 'puppet-release-bionic.deb'

puppet-release-bionic.deb          100%[===================================================================>]  11.46K  --.-KB/s    in 0.002s

2022-04-06 13:24:55 (4.73 MB/s) - 'puppet-release-bionic.deb' saved [11736/11736]

root@09e4408aeae4:/#
```

dpkg –i puppet-release-bionic.deb

```
root@09e4408aeae4:/# dpkg -i puppet-release-bionic.deb
Selecting previously unselected package puppet-release.
(Reading database ... 4470 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@09e4408aeae4:/#
```

apt install puppetmaster

```
root@09e4408aeae4:/# apt-get 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
```

apt install systemctl

```
root@09e4408aeae4:/# 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 2 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 1.4.3424-2 [75.5 kB]
Fetched 75.5 kB in 1s (75.0 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package systemctl.
(Reading database ... 11306 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) ...
root@09e4408aeae4:/#
```

systemctl start puppet–master.service

```
root@09e4408aeae4:/# systemctl start puppet-master.service
root@09e4408aeae4:/# cd etc
root@09e4408aeae4:/etc# cd hosts
bash: cd: hosts: Not a directory
root@09e4408aeae4:/etc# cat 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      09e4408aeae4
root@09e4408aeae4:/etc#
```

Puppet Slave
Install wget

```
root@fee3da376acf:/# 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 2 not upgraded.
```

wget http://apt.puppetlabs.com/puppet-release-bionic.deb

```
root@fee3da376acf:/# wget http://apt.puppetlabs.com/puppet-release-bionic.deb
--2022-04-06 13:38:01--  http://apt.puppetlabs.com/puppet-release-bionic.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com)... 108.159.80.20, 2600:9000:238c:7000:1d:fc37:1cc0:93a1, 2600:9000:238c:4000:1d:fc37:1cc0:93a1,
...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|108.159.80.20|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11736 (11K) [application/x-debian-package]
Saving to: 'puppet-release-bionic.deb'

puppet-release-bionic.deb         100%[===================================>]  11.46K  --.-KB/s    in 0.002s

2022-04-06 13:38:01 (6.31 MB/s) - 'puppet-release-bionic.deb' saved [11736/11736]

root@fee3da376acf:/#
```

dpkg –i puppet-release-bionic.deb

```
root@fee3da376acf:/# dpkg -i puppet-release-bionic.deb
Selecting previously unselected package puppet-release.
(Reading database ... 4470 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@fee3da376acf:/#
```

apt install puppet

```
root@fee3da376acf:/# apt-get 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
```

Conclusion:	
	We come to know about how to install puppet for software configuration management.