DevOps

PUPPET

By
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Introducing Myself

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Boring Stuff about me:

- 14+ years of experience in development and training
- Started with Java, moved to Android and now working on Big Data Technologies

Interesting Things about me:

- Actually Nothing !

Getting to know you

Show of hands please!

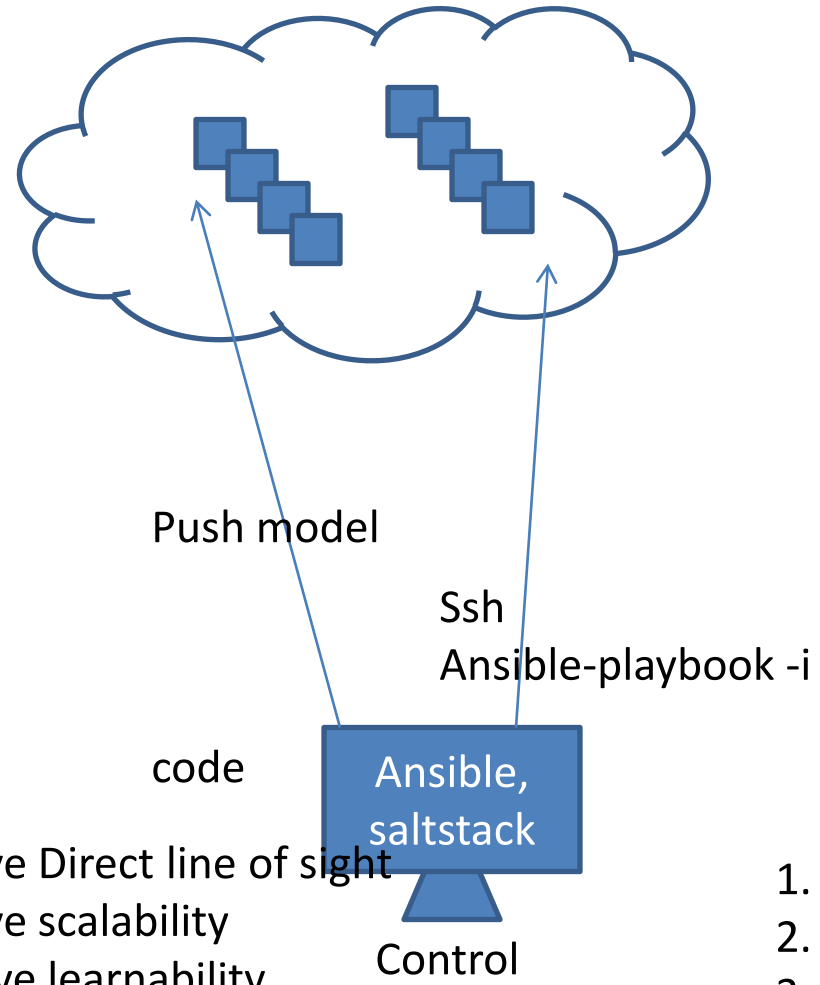
- Any freshers in this group?
- What is the general development experience of this group
    - 0-2 years, 0-5 years, 5 and above
- What programming area are you currently working on?
    - Java, Web Stack, Analytics, Big data, any other
- Why are you learning python programming?
    - Sys admin, Web development, Data Analytics, IoT, any other

Puppet

A GPL Open Source Project written in Ruby

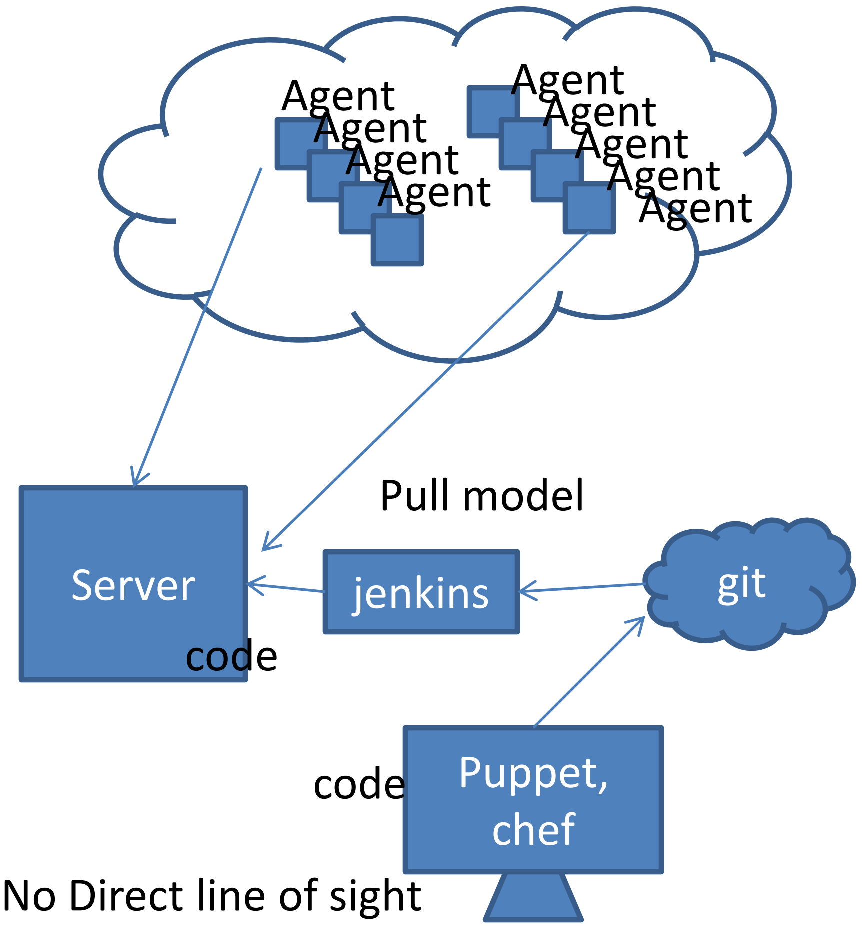
- A declarative language for expressing system configuration
- A Client and server
- A library to realize the configuration
- Puppet is the abstraction layer between the system admini
strator and the system
- Puppet requires only Ruby and Facter
- Client runs every 30 minutes by default

Agent less systems



1. -ve Direct line of sight
2. -ve scalability
3. +ve learnability
4. Provisioning +ve

Agent based systems



1. No Direct line of sight
2. Scalability
3. -ve learnability
4. Provisioning difficulties

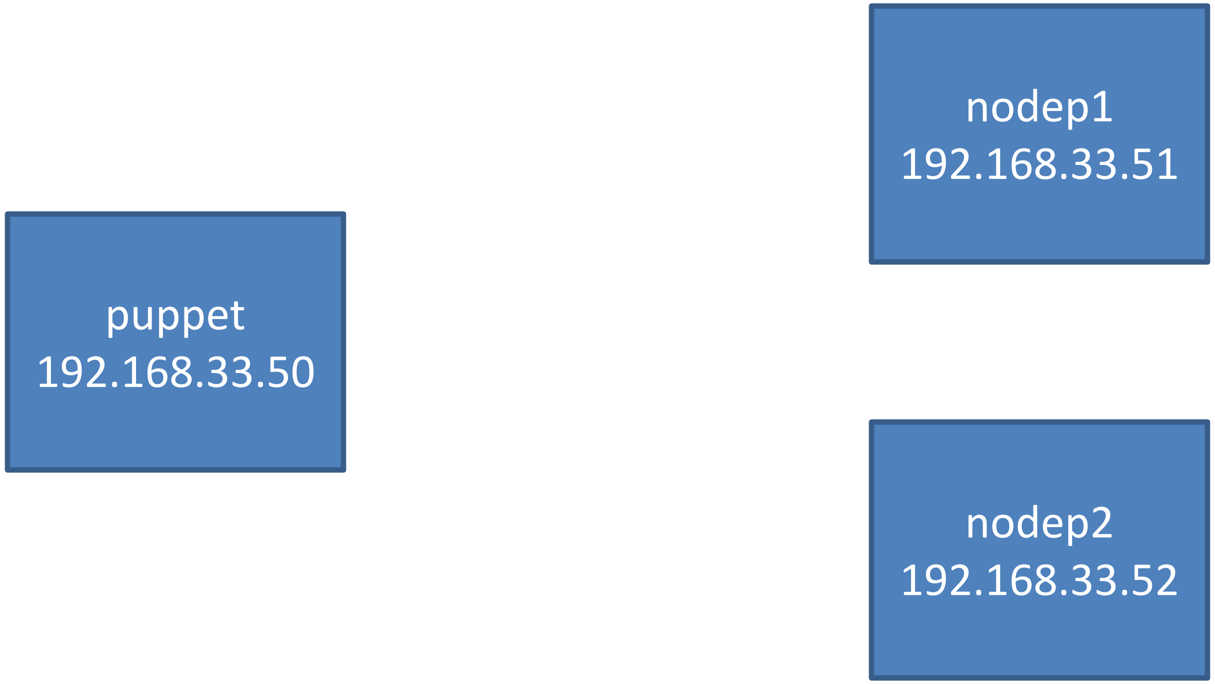
Our Setup

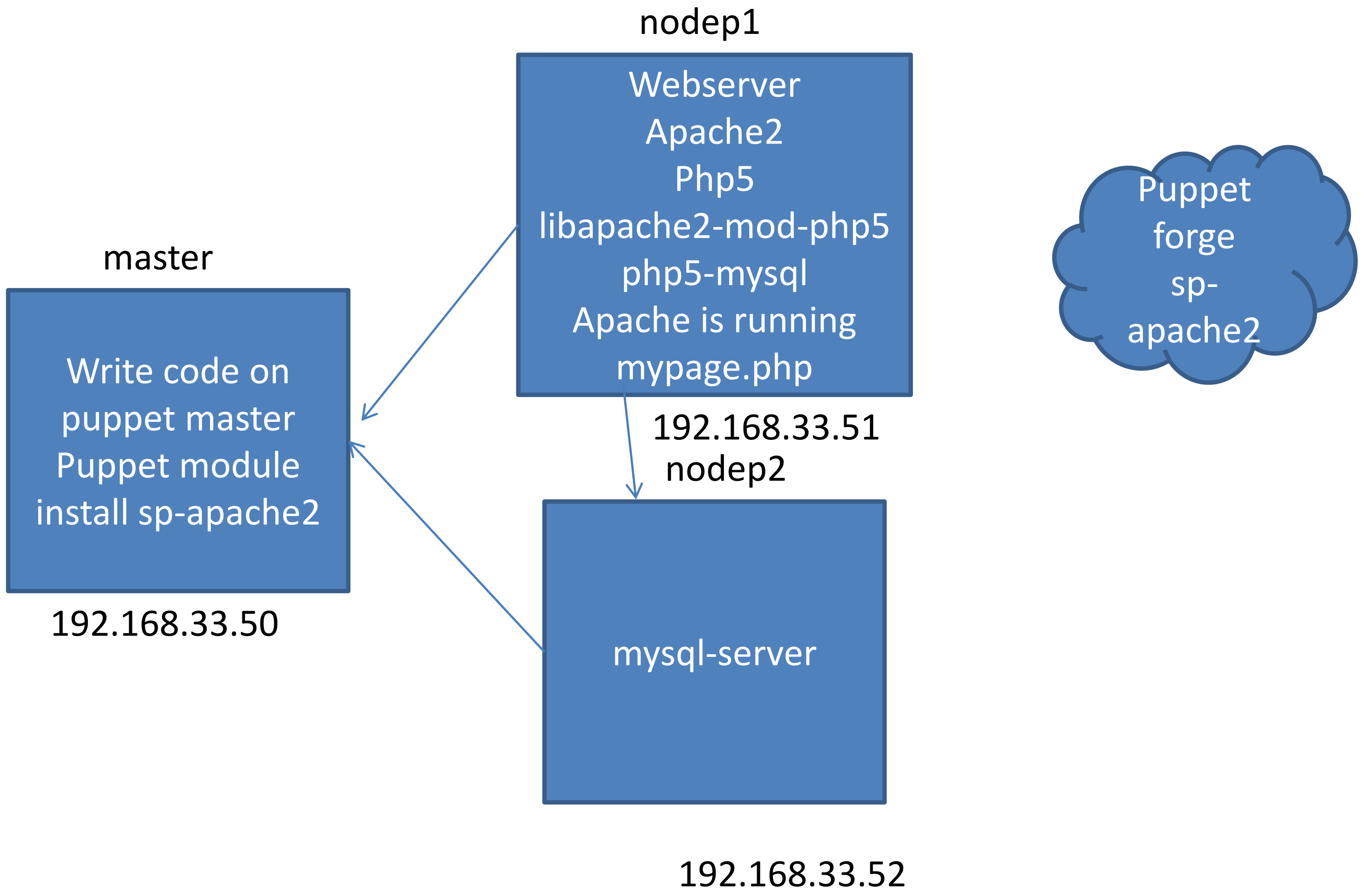
Vagrant and Virtual Box

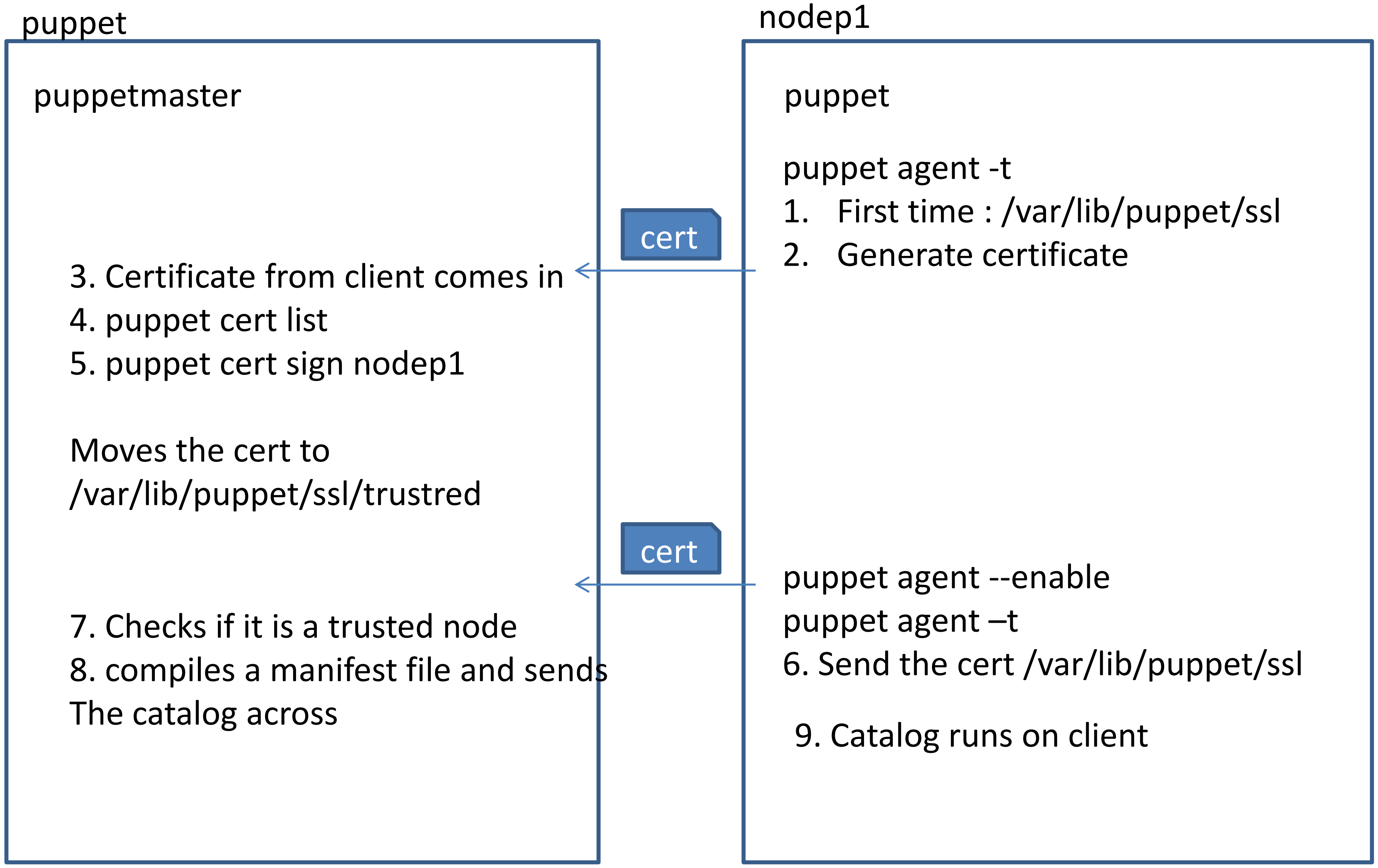
Vagrant will help

- Bring up VMs with configuration
- Sets Network interfaces
- Run some scripts
- Memory
- shared folder setup

Our Setup




nodep1
Webserver
Apache2
Php5
libapache2-mod-php5
php5-mysql
Apache is running
mypage.php
192.168.33.51
Puppet
forge
sp-
apache2
master
Write code on
puppet master
Puppet module
install sp-apache2
192.168.33.50
nodep2
mysql-server
192.168.33.52



puppet

puppetmaster

3. Certificate from client comes in
4. puppet cert list
5. puppet cert sign nodep1

Moves the cert to
/var/lib/puppet/ssl/trustred

7. Checks if it is a trusted node
8. compiles a manifest file and sends
The catalog across

nodep1

puppet

puppet agent -t
1. First time : /var/lib/puppet/ssl
2. Generate certificate

puppet agent --enable
puppet agent –t
6. Send the cert /var/lib/puppet/ssl

9. Catalog runs on client

Our Setup

Some vagrant commands

1. **vagrant up**
   Brings up all the nodes
2. **vagrant up nodep1**
   Brings up only nodep1
3. **vagrant halt**
   Stops all nodes
4. **vagrant halt nodep1**
   Stops only nodep1
5. **vagrant destroy**
   Destroys the VM. All changes will be lost

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Understanding Puppet Components

Puppet master

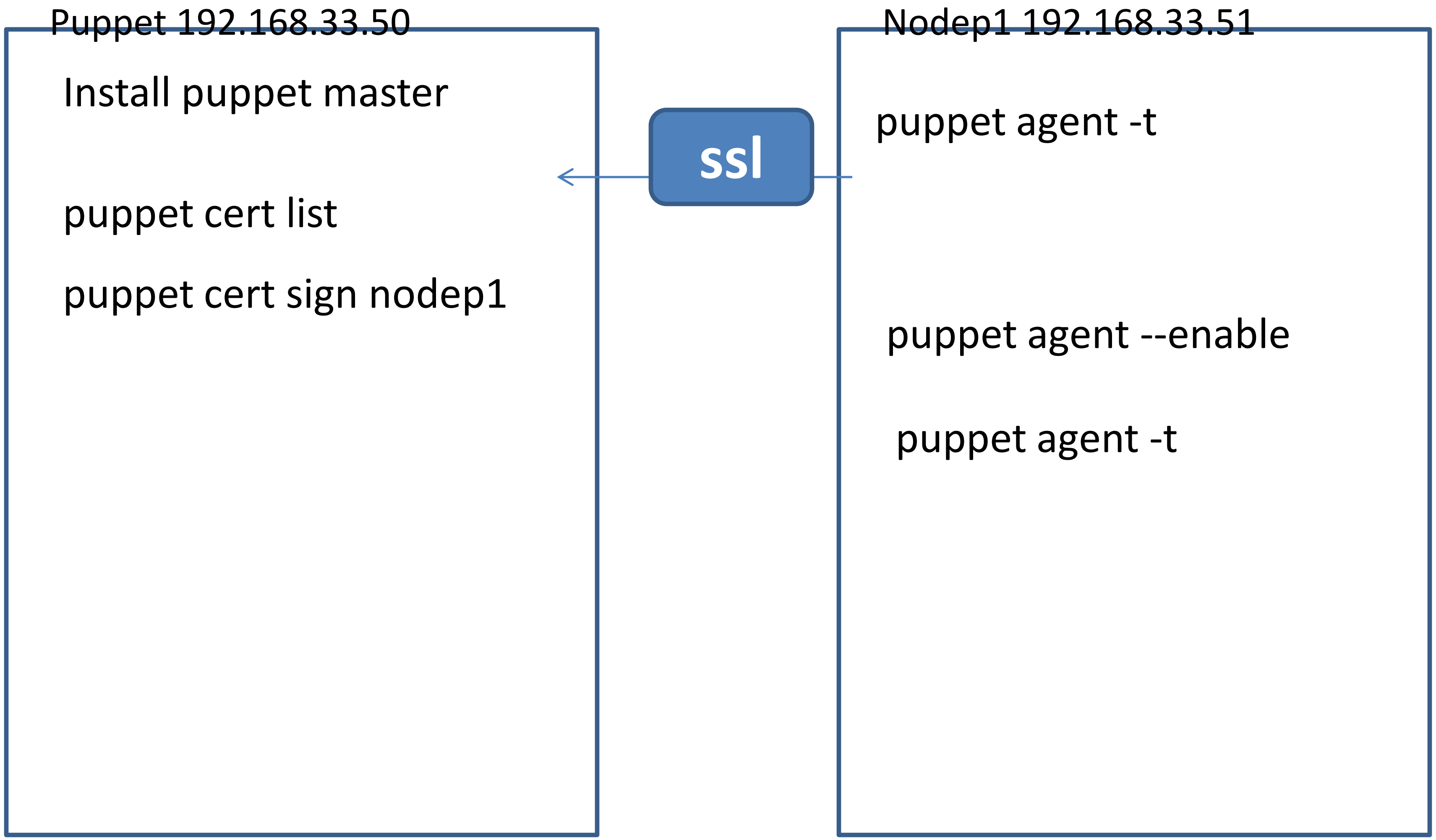
Puppet Client

Puppet Types

A Type is the actual work horse that Puppet knows how to configure

- Files (content, permissions, ownership)
- Packages (ensure installed or absent)
- Services (enabled/disabled, running/stopped)
- Exec (run commands)

Types are used in manifest files


Puppet 192.168.33.50
Install puppet master
puppet cert list
puppet cert sign nodep1
ssl
Nodep1 192.168.33.51
puppet agent -t
puppet agent --enable
puppet agent -t

Writing a manifest file

```
root@nodep1:/home/vagrant# cat helloworld.pp
file {'/tmp/hello.txt':
        content => 'Hello World',
        ensure => present,
        mode => '0655',
        owner => 'vagrant',
        group => 'vagrant'
}
root@nodep1:/home/vagrant#
```

Running a manifest file

Use --noop for a dry run . Noop stands for no operation
The below output says that it **“would have”** created a file if we ran without --noop

```
root@nodep1:/home/vagrant# puppet apply helloworld.pp --noop
Notice: Compiled catalog for nodep1.belkin in environment production
in 0.06 seconds
Notice: /Stage[main]/Main/File[/tmp/hello.txt]/ensure: current_value
absent, should be present (noop)
Notice: Class[Main]: Would have triggered 'refresh' from 1 events
Notice: Stage[main]: Would have triggered 'refresh' from 1 events
Notice: Finished catalog run in 0.10 seconds
```

Running a manifest file

An actual run

```
root@nodep1:/home/vagrant# puppet apply helloworld.pp
Notice: Compiled catalog for nodep1.belkin in environment production
in 0.06 seconds
Notice: /Stage[main]/Main/File[/tmp/hello.txt]/ensure: created
Notice: Finished catalog run in 0.10 seconds
root@nodep1:/home/vagrant# ls -ltra /tmp/hello.txt
-rw-r-xr-x 1 vagrant vagrant 11 Mar 15 01:11 /tmp/hello.txt
```

Modules

Modules are resuable components

Modules are self-contained bundles of code and data.
These reusable, shareable units of Puppet code are a basic building block for Puppet.

Creating a module

Using puppet given scaffolding to create a module

The module name should be <author>-<name of the module> as this is how its stored in puppet forge

We need to remote “sp-” from the module name while running the modules

```
root@nodep1:/home/vagrant/demo# puppet module generate sp-apache2
Notice: Generating module at /home/vagrant/demo/sp-apache2
sp-apache2
sp-apache2/Modulefile
sp-apache2/README
sp-apache2/manifests
sp-apache2/manifests/init.pp
sp-apache2/spec
sp-apache2/spec/spec_helper.rb
sp-apache2/tests
sp-apache2/tests/init.pp
root@nodep1:/home/vagrant/demo# mv sp-apache2 apache2
```

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Adding resources to module

```
root@nodep1:/home/vagrant/demo# cat apache2/manifests/init.pp
class apache2 {
 package{'apache2':}
}
```

Including the module in a manifest file

```
root@nodep1:/home/vagrant/demo# ls
apache2  installapache.pp
root@nodep1:/home/vagrant/demo# cat installapache.pp
include apache2

root@nodep1:/home/vagrant/demo#
```

Run the manifest installapache.pp

In the below output it empty as apache2 was already installed on nodep1

```
root@nodep1:/home/vagrant/demo# puppet apply --modulepath
/home/vagrant/demo installapache.pp
Notice: Compiled catalog for nodep1.belkin in environment production
in 0.01 seconds
Notice: Finished catalog run in 0.09 seconds
root@nodep1:/home/vagrant/demo#
```

Creating a module

Using puppet given scaffolding to create a module
The module name should be <author>-<name of the module> as this is how its stored in puppet forge
We need to remote “sp-” from the module name while running the modules

```
root@nodep1:/home/vagrant/demo# puppet module generate sp-apache2
Notice: Generating module at /home/vagrant/demo/sp-apache2
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sp-apache2/Modulefile
sp-apache2/README
sp-apache2/manifests
sp-apache2/manifests/init.pp
sp-apache2/spec
sp-apache2/spec/spec_helper.rb
sp-apache2/tests
sp-apache2/tests/init.pp
```

Facter

Facter gathers information about the client, which can be used as variables within puppet.

- You can add custom facts as needed.

Class

- A named collection of type objects
- Can include or inherit from other classes

```
class sudo_class {
		include foo_class file { “/etc/sudoers”: ... }
		package{ “sudo”: ... }
}
```

Class Inheritance

```
class afile {
        file { “/tmp/foo”: ensure => file source =>
“/src/versionA” }
        }
class another_file inherits afile {
        File[“/tmp/foo”] { source => “/src/versionB” }
}
```

Node

A configuration block matching a client

- Can contain types, classes
- “default” node matches any client without a node block

```
node “ohad.myself” {
            include sudo_class
            include other_class
}
```