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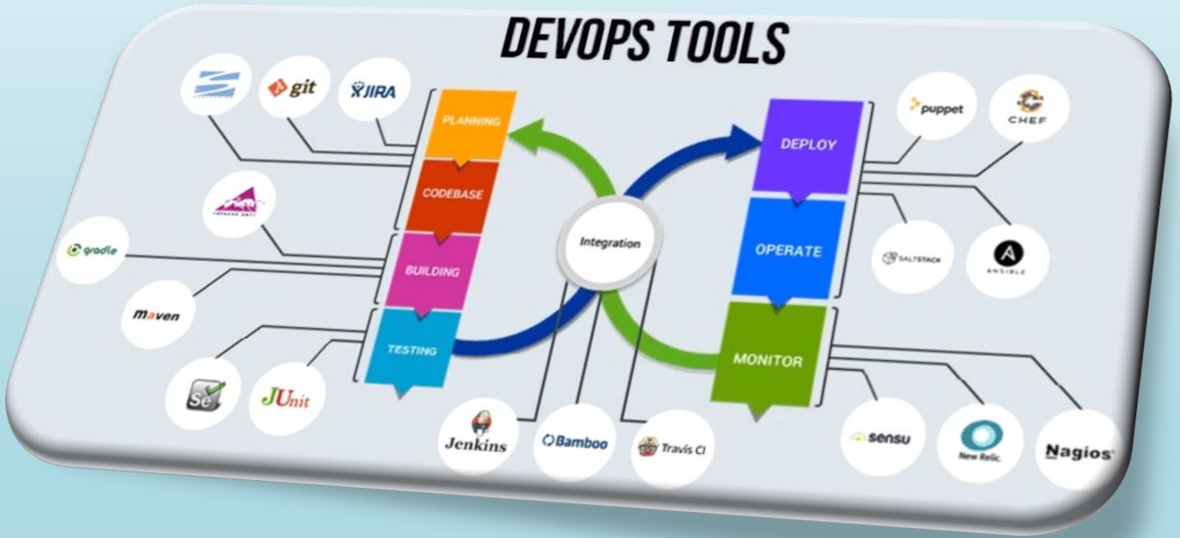
Configuration Management [Puppet]



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Agenda

Why Configuration Management?

Why Configuration Management?

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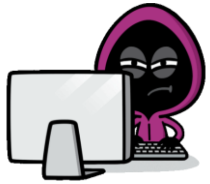
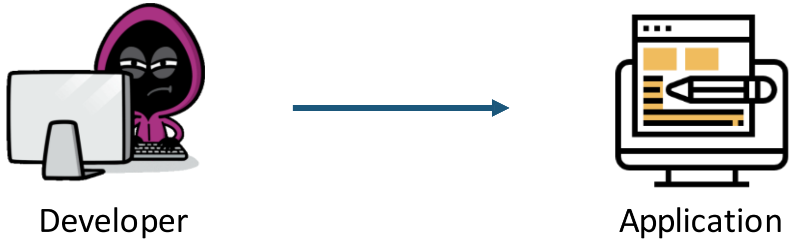


Developer

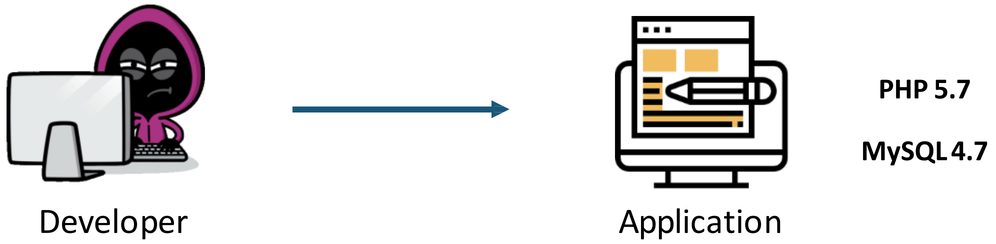
Why Configuration Management?



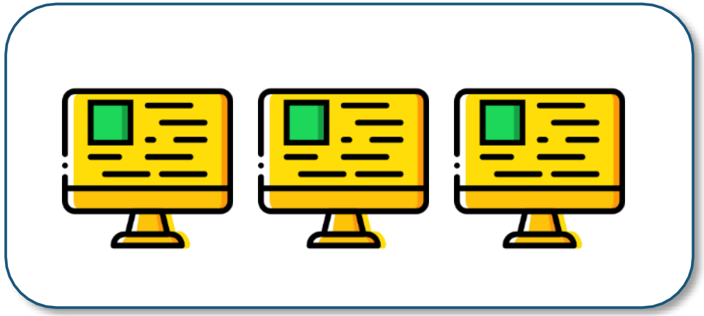
PHP 5.7

MySQL 4.7

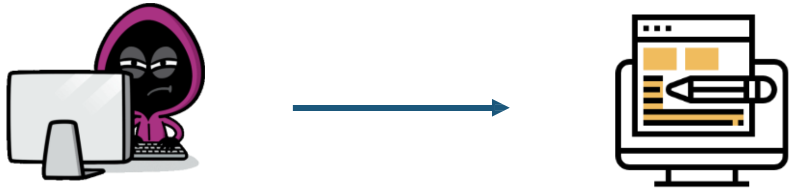
Why Configuration Management?



PHP Servers


Database Servers

Why Configuration Management?



What is Configuration Management?

What is Configuration Management?

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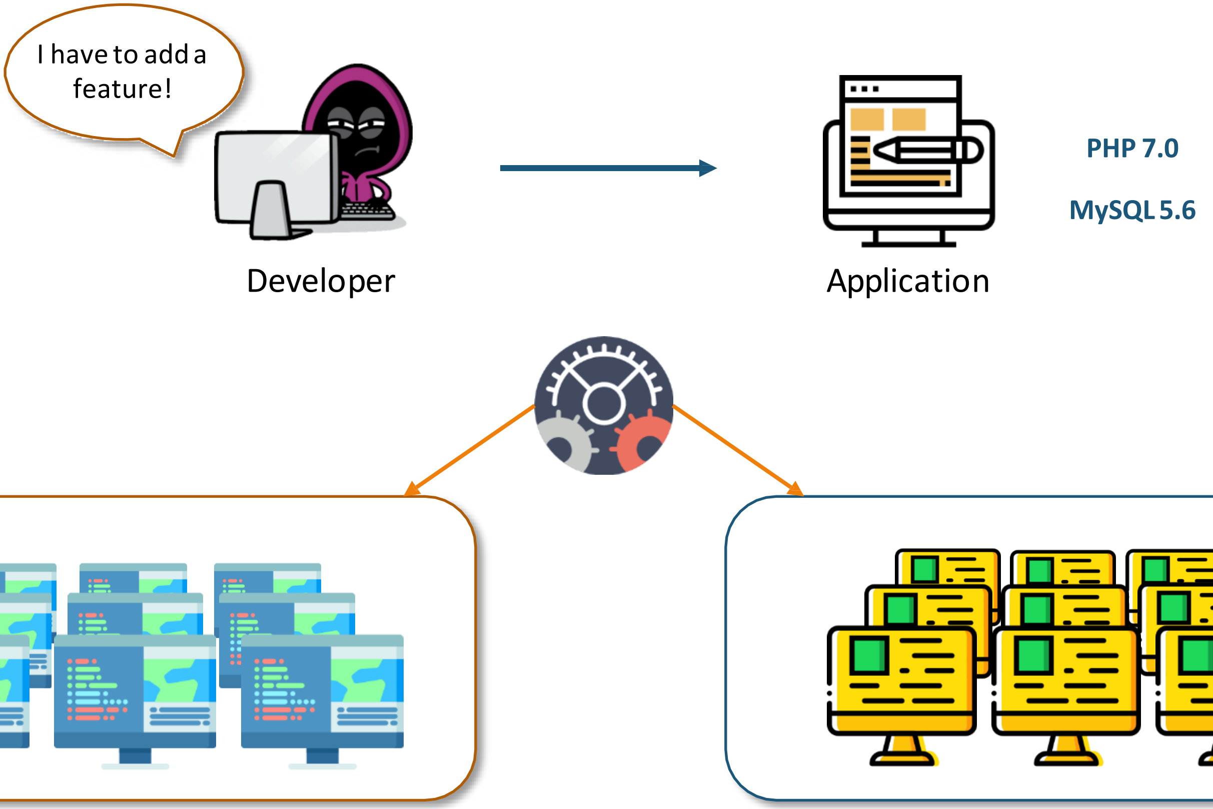
Configuration management is a systems engineering process for establishing and maintaining consistency of a product's performance, functional and physical attributes with its requirements, design and operational information throughout its life.

What is Configuration Management?



PHP 7.0 Servers

Database 5.6 Servers

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Configuration Management Features

- Automation
- Consistency
- Software Updates
- Software Rollback

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Configuration Management Tools

Types of Configuration Management Tools

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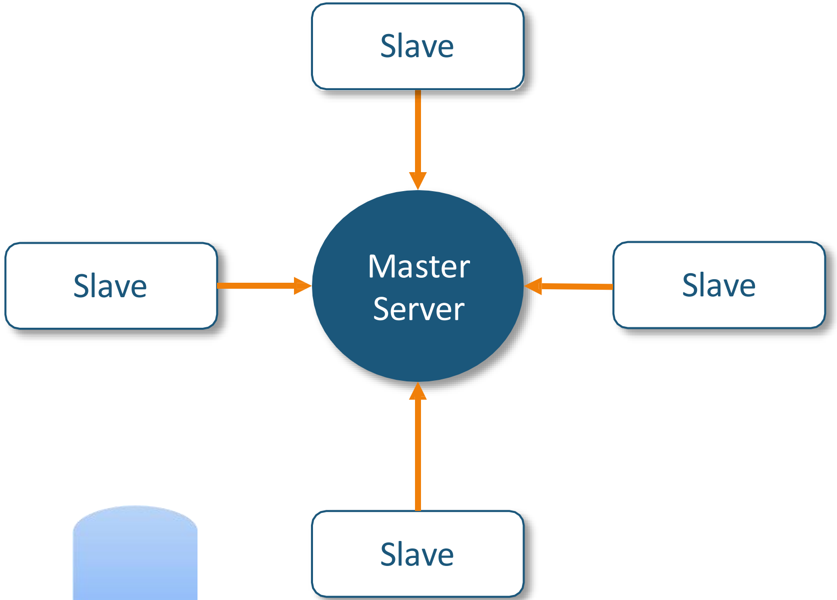
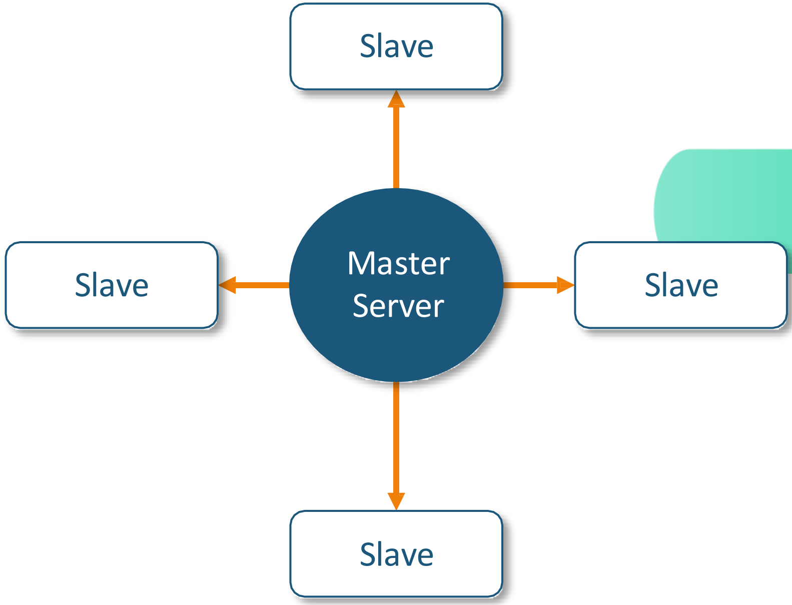
Pull Configuration



Changes arepulled

Push Configuration



Changes arepushed

Types of Configuration Management Tools

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Pull Configuration

puppet

CHEF

Push Configuration

ANSIBLE

SALTSTACK

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What is Puppet?

What is Puppet?

Puppet is an open-source software configuration management tool. It runs on many Unix-like systems, as well as on Microsoft Windows, and includes its own declarative language to describe the system configuration.

puppet

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Key Features of Puppet

- Large UserBase
- Big Open-source Community
- Documentation
- Platform Support

Refer Puppet Documentation here:
https://puppet.com/docs/puppet/7/puppet_index.html

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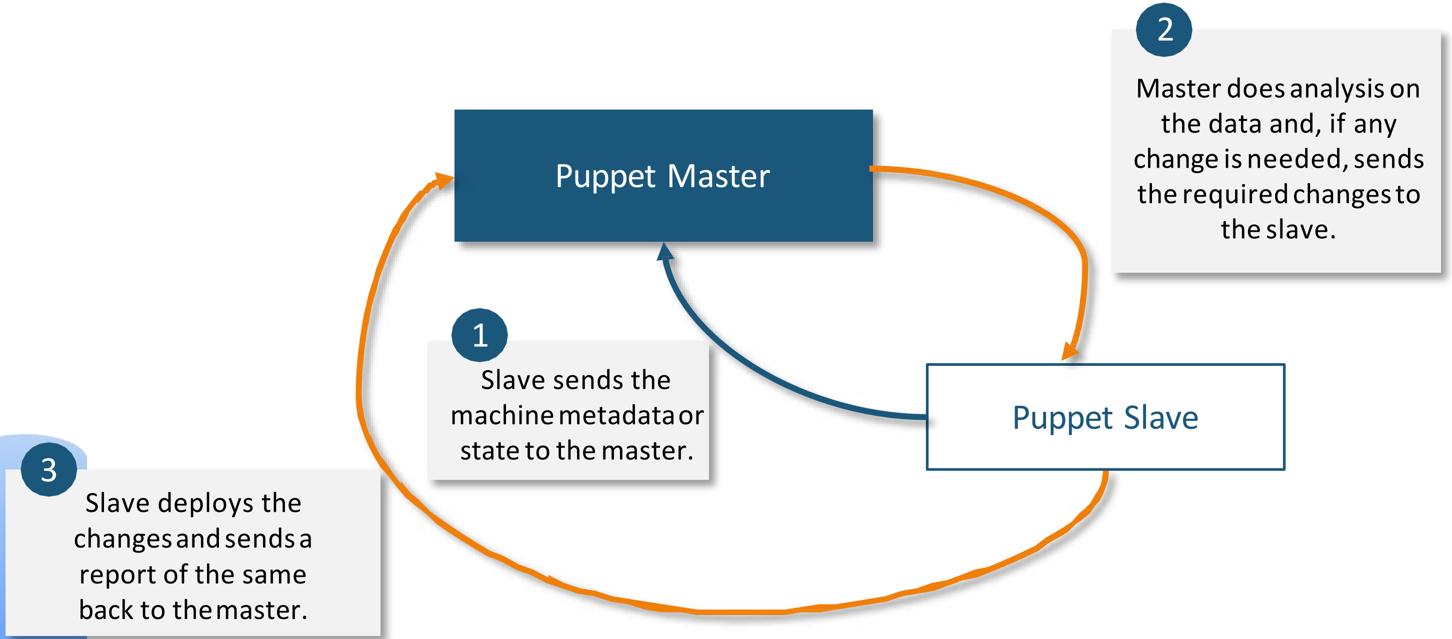
Puppet Architecture

Puppet Architecture

Puppet follows a Master–Slave architecture, the working of which has been explained in the below diagram.



Puppet Master
Puppet Slave
1
Slave sends the machine metadata or state to the master.
2
Master does analysis on the data and, if any change is needed, sends the required changes to the slave.
3
Slave deploys the changes and sends a report of the same back to the master.

Puppet Architecture: SSL Connection

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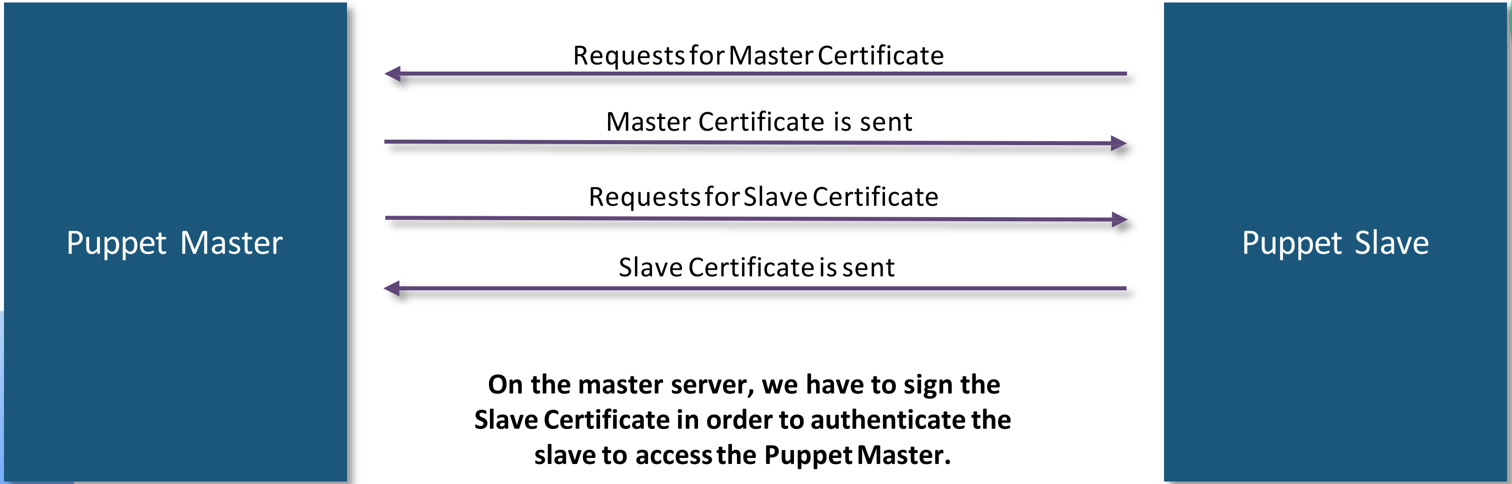
Because Puppet nodes have to interact with the master, all the information which is communicated between the master node and slave nodes are encrypted using SSL certificates.
The certificate signing process is as follows:


Puppet Master
Requests for Master Certificate
Master Certificate is sent
Requests for Slave Certificate
Slave Certificate is sent
Puppet Slave

On the master server, we have to sign the Slave Certificate in order to authenticate the slave to access the Puppet Master.

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Setting up Puppet Master–Slave

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Code Basics for Puppet

Code Basics for Puppet: Resource

The most basic component of Puppet Code is a **resource**. A resource describes something about the state of the system, such as if a certain user or file should exist, or a package should be installed, etc.

Syntax

```
resource_type { ‘resource_name’:

      attribute => value,
                 …
  }
```

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Code Basics for Puppet: Resource Example

Example

```
package { ‘nginx’:
ensure => ‘installed’,
}
```

Sample nginx package

Code Basics for Puppet: Resource Types

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There are three kinds of resource types:

Puppet core or built-in resource types:
Core or built-in resource types are the pre-built puppet resource types shipped with puppet software. All of the core or built-in Puppet resource types are written and maintained by Puppet team.

Puppet defined resource types:
Defined resource types are lightweight resource types written in Puppet declarative language using a combination of existing resource types.

Puppet custom resource types:
Custom resource types are completely customized resource types written in Ruby.

Code Basics for Puppet: Resource Commands

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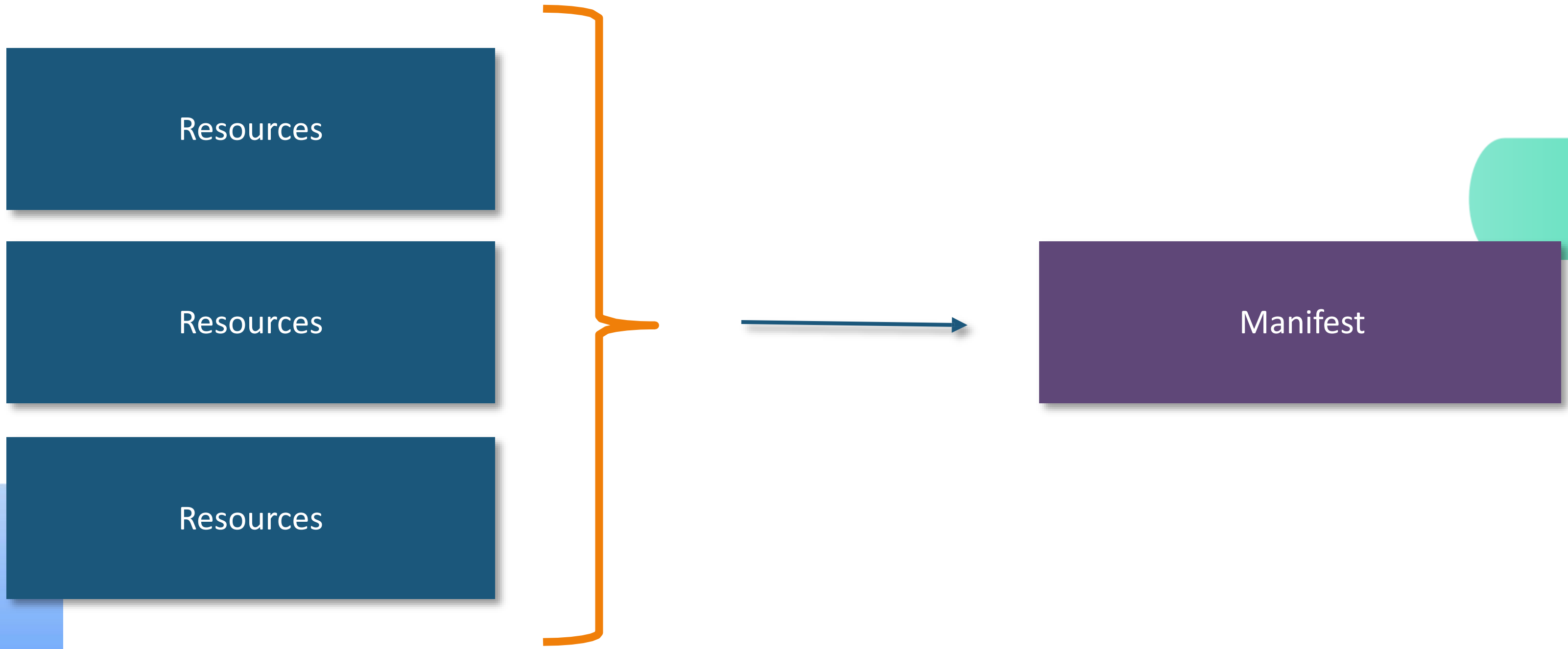
```
puppet --help
puppet resource –help
puppet resource –types
puppet describe <resource type name>
puppet apply <file>

puppet config set server puppetserver.example.com --section main
```

Code Basics for Puppet: Manifest



Code Basics for Puppet: Manifest

Manifests are basically a collection of resource declarations, using the extension **.pp**.

Example

```
package {  'nginx':
ensure => 'installed',
}

file {'/tmp/hello.txt':
ensure => present,
content => 'hello world',
mode => '0644',

}
```

Sample ManifestFile

Code Basics for Puppet: Manifest

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Variables

Loops

Conditions

Variables can be defined at any point in a manifest. The most common types of variables are strings and arrays of strings, but other types are also supported, such as Booleans and hashes.

Example

```
$text = “hello world”

file {‘/tmp/hello.txt’:
  ensure => present,
  content => $text,
  mode => ‘0644’,
}
```

Code Basics for Puppet: Manifest

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Variables

Loops

Conditions

Loops are typically used to repeat a task using different input values. For instance, instead of creating 10 tasks for installing 10 different packages, you can create a single task and use a loop to repeat the task with all different packages you want to install.

Example

```
$packages = [‘nginx’,’mysql-server’]

package { $packages:
 ensure => installed,
}
```

Code Basics for Puppet: Manifest

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Variables

Loops

Conditions

Conditions can be used to dynamically decide whether or not a block of code should be executed, based on a variable or an output from a command, for instance.

Example

```
exec { "Test":
command =>'/bin/echo apache2 is installed > /tmp/status.txt',
onlyif => '/bin/which apache2',
}
```

Code Basics for Puppet: Manifest

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Variables

Loops

Conditions

Conditions can be used to dynamically decide whether or not a block of code should be executed, based on a variable or an output from a command, for instance.

Example

```
exec { “Test”:
command =>‘/bin/echo apache2 is not installed > /tmp/status.txt’,
unless => ‘/bin/which apache2’,
}
```

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Applying Configuration Using Modules

What are Modules?

A collection of manifests and other related files organized in a predefined way to facilitate sharing and reusing parts of a provisioning

1. sudo puppet module generate <name>
2. Edit the init.pp with a class, and build the module
3. Finally, install the module

What are Classes?

Just like with regular programming languages, classes are used in Puppet to better organize the provisioning and make it easier to reuse portions of the code.

Example

```
Class hello{

                        exec { “Test”:
    command =>‘/bin/echo apache2 is installed > /tmp/status.txt’,
                unless => ‘/bin/which apache2’,
            }

}
```

Overall Picture

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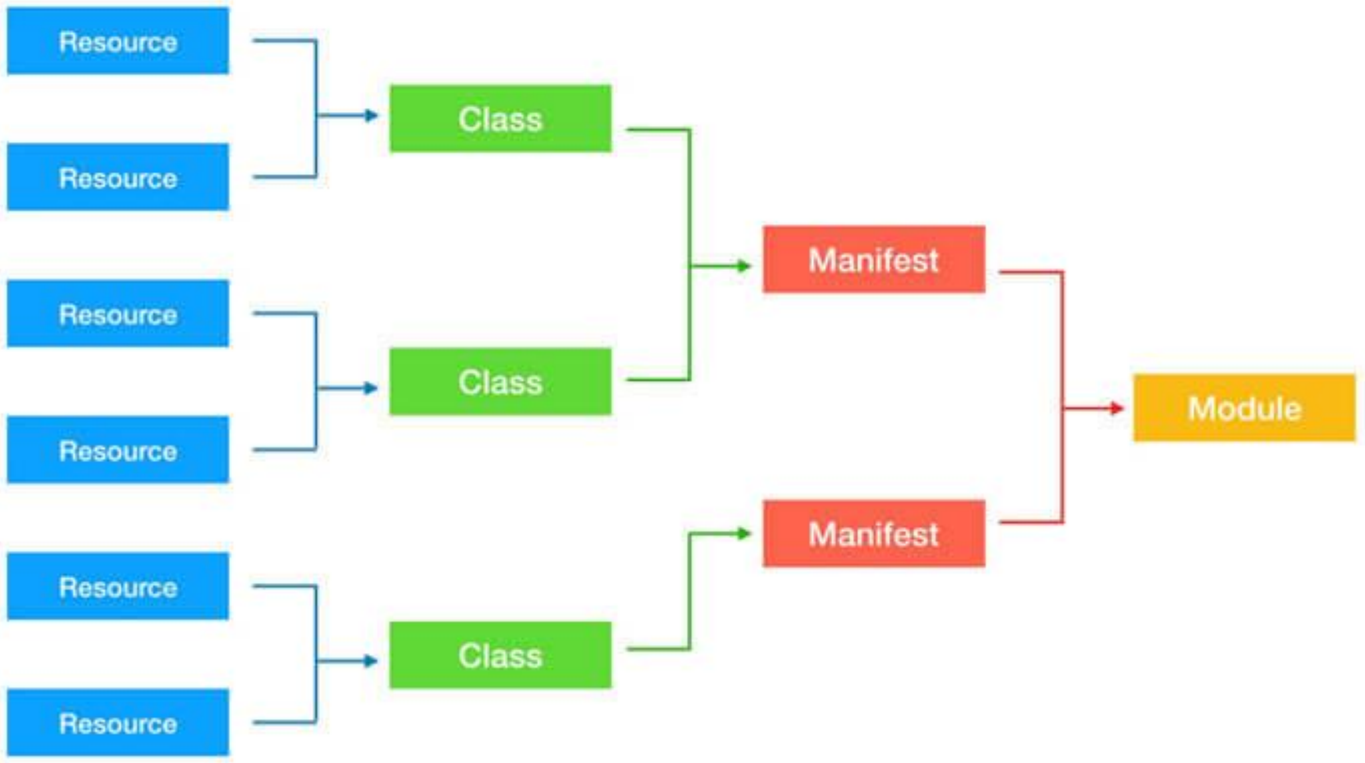

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Hands-on: Applying Configuration Using Modules

Hands-on: Invoking Module’s Classes

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