

Chef: Scripts to Recipes

Installing Tomcat 8 on CentOS 6.7

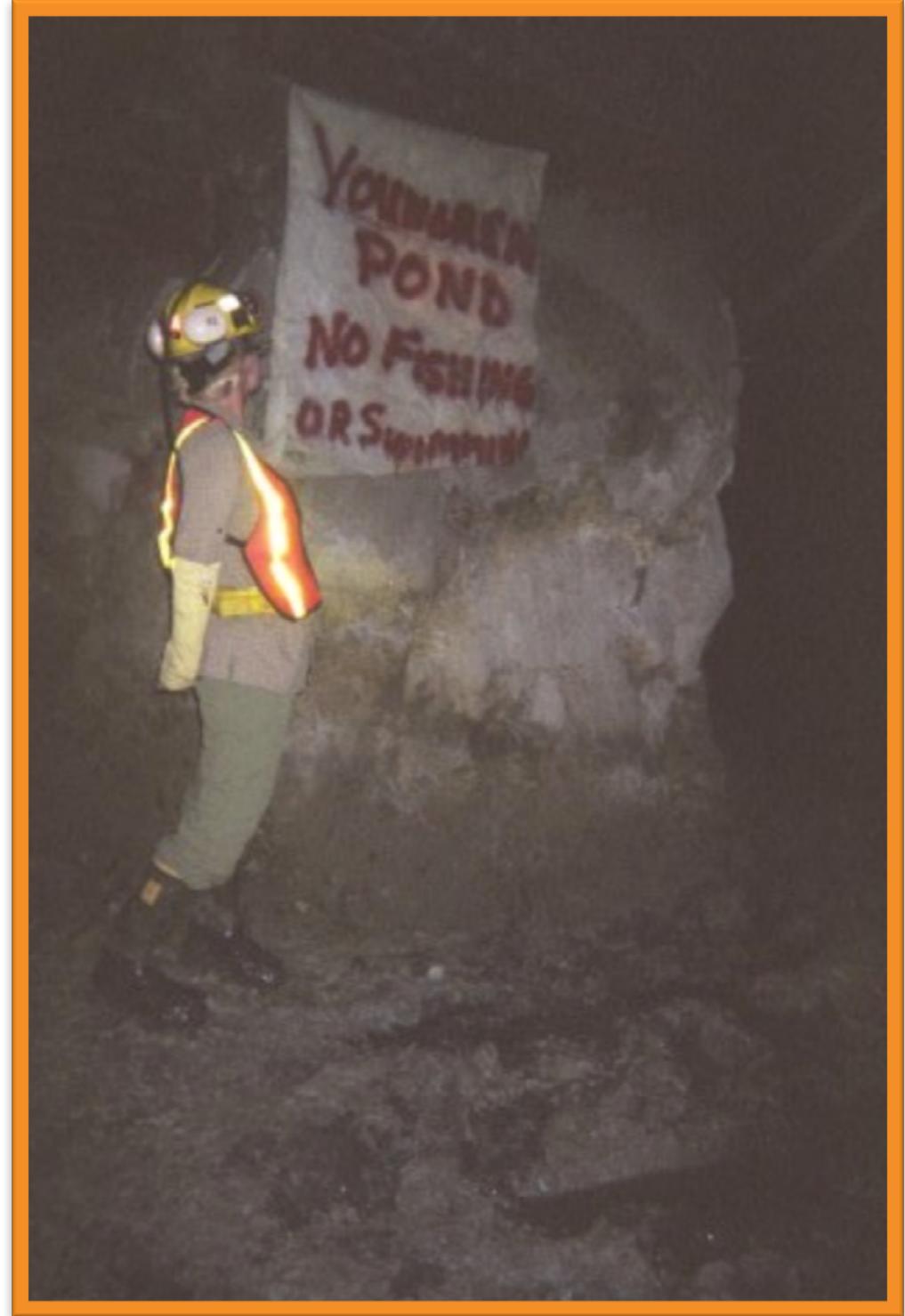
Presenter

Morgan Drake, Solutions Architect

Linux engineer

Rust enthusiast

Recovering geologist



You

New to Chef

Smart, intelligent, and funny

Understand what Chef does but not how it does it

Understand some Linux system administration and application deployment



Schedule

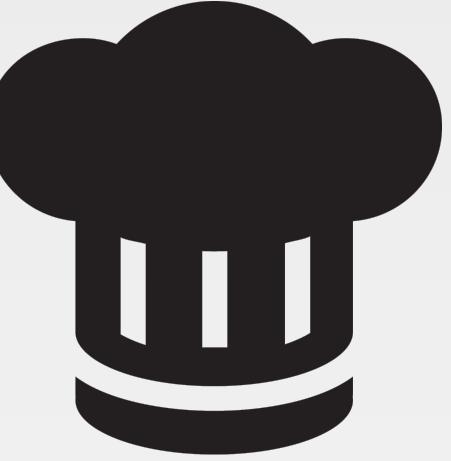
- NOW** – Housekeeping
- @ 3 min** – Slides & Exercises
- @ 70 min** – Questions
- @ 75 min** – Resources and Wrap-up

Agenda

- ✓ Introductions
- Setup Workstation
- Convert Script to a Recipe
- Questions and Wrap-Up



EXERCISE



Pre-built Workstation

We will provide for you a workstation with all the tools installed.

Objective:

- Login to the Remote Workstation

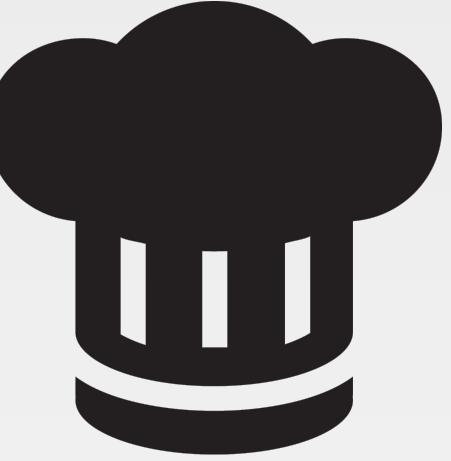
Logging in to the Workstation



```
> ssh IPADDRESS -l USERNAME
```

```
The authenticity of host '54.209.164.144 (54.209.164.144)' can't  
be established. RSA key fingerprint is  
SHA256:tKoTsPbn6ER9BLThZqntXTxIYem3zV/iTQWvhLrBIBQ. Are you sure  
you want to continue connecting (yes/no)? yes  
chef@54.209.164.144's password: PASSWORD  
chef@ip-172-31-15-97 ~]$
```

EXERCISE



Pre-built Workstation

We will provide for you a workstation with all the tools installed.

Objective:

- ✓ Login to the Remote Workstation

Agenda

- ✓ Introductions
- ✓ Setup Workstation
- Convert Script to a Recipe
- Questions and Wrap-Up



MOTIVATION

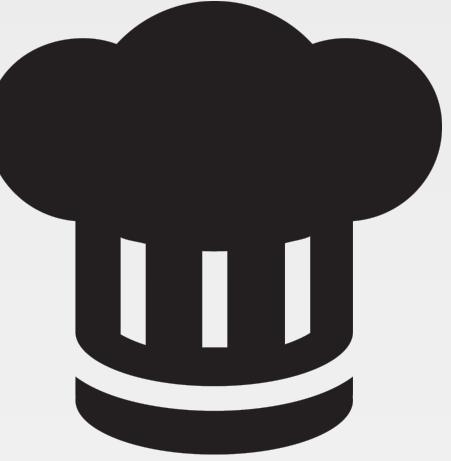


Installing Tomcat

As an exercise you have been tasked with installing Tomcat 8 on a CentOS 6.7 node. We have provided you the machine and have already installed the tools.

Together we are going to walk through the process of writing Chef code and then applying it to the system to explore the various tools and important concepts within Chef.

EXERCISE



Learning How to Chef

We've got this script that works in a file or on our Wiki. Could I automate the creation with Chef?

Objective:

- Review the existing installation instructions
- Create a cookbook
- Write the first resource
- Apply the cookbook to the system

REFERENCE



Tomcat Setup Instructions

The setup instructions have been created for you and can be found at the specified link. We are going to use these instructions throughout this workshop.

<https://goo.gl/srvJtu>

learn.chef.io/skills/joy-of-automating-episode-1

Install Prerequisite Packages

```
$ sudo yum install java-1.7.0-openjdk-devel
```

This installs the Java Development Kit on the system.

Create Required Users

```
$ sudo groupadd chef  
$ sudo useradd -g chef chef
```

This creates the user that will run the Tomcat process.

Download and Extract Tomcat

```
$ cd /tmp  
$ wget http://mirror.sdunix.com/apache/tomcat/tomcat-  
8/v8.0.33/bin/apache-tomcat-8.0.33.tar.gz  
  
$ sudo mkdir /opt/tomcat  
$ sudo tar xvf apache-tomcat-8*tar.gz -C /opt/tomcat --strip-  
components=1
```

We are installing Tomcat from source so we need to download it from a remote location, create a home for it and then unzip it into that new location.

Set the Correct Directory Permissions

```
$ cd /opt/tomcat  
$ sudo chgrp -R chef conf  
$ sudo chmod g+rwx conf  
$ sudo chmod g+r conf/*  
$ sudo chown -R chef webapps/ work/ temp/ logs/ conf/
```

The Tomcat directory needs to be setup with the correct permissions and owners for the application to work correctly.

Set up the Tomcat Service

```
$ sudo vi /etc/systemd/system/tomcat.service  
$ sudo systemctl daemon-reload  
$ sudo systemctl start tomcat  
$ sudo systemctl enable tomcat
```

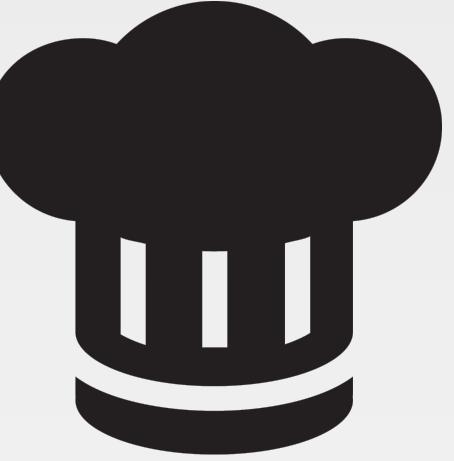
The Tomcat application needs to have the service file created and then have it started to ensure that when the machine reboots that it starts again.

Verify that Tomcat is Running

```
$ curl http://localhost:8080
```

When the system is configured Tomcat should be running and available on the machine.

EXERCISE



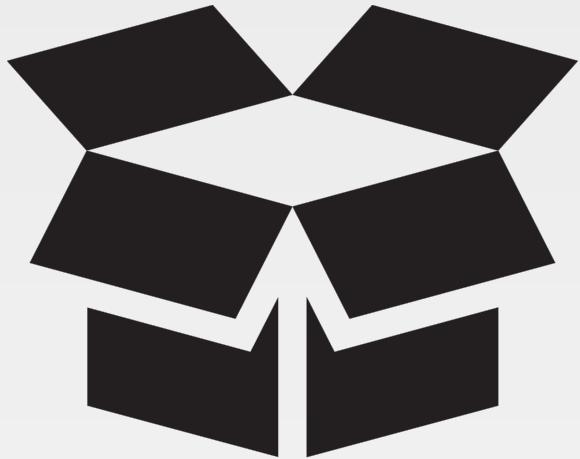
Learning How to Chef

If we wanted to do this with Chef, where do we start?

Objective:

- Review the existing installation instructions
- Create a cookbook
- Write the first resource
- Apply the cookbook to the system

CONCEPT



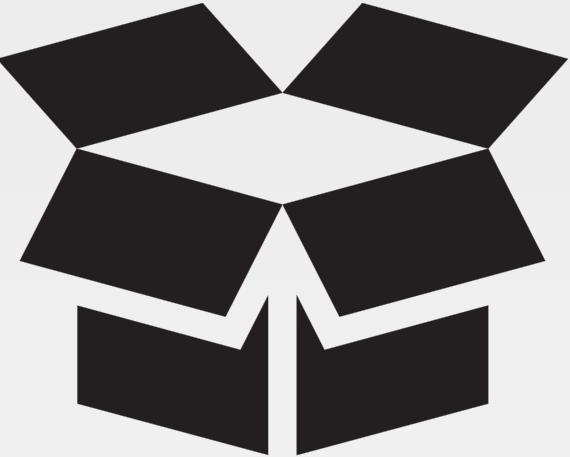
Cookbook

A Chef cookbook is the fundamental unit of configuration and policy distribution.

Each cookbook defines a scenario, such as everything needed to install and configure MySQL, and then it contains all of the components that are required to support that scenario.

docs.chef.io/cookbooks.html

CONCEPT



chef

An executable program that allows you generate cookbooks and cookbook components.

docs.chef.io/ctl_chef.html

Creating a Cookbooks Directory



```
> mkdir cookbooks
```

Creating a tomcat cookbook in cookbooks



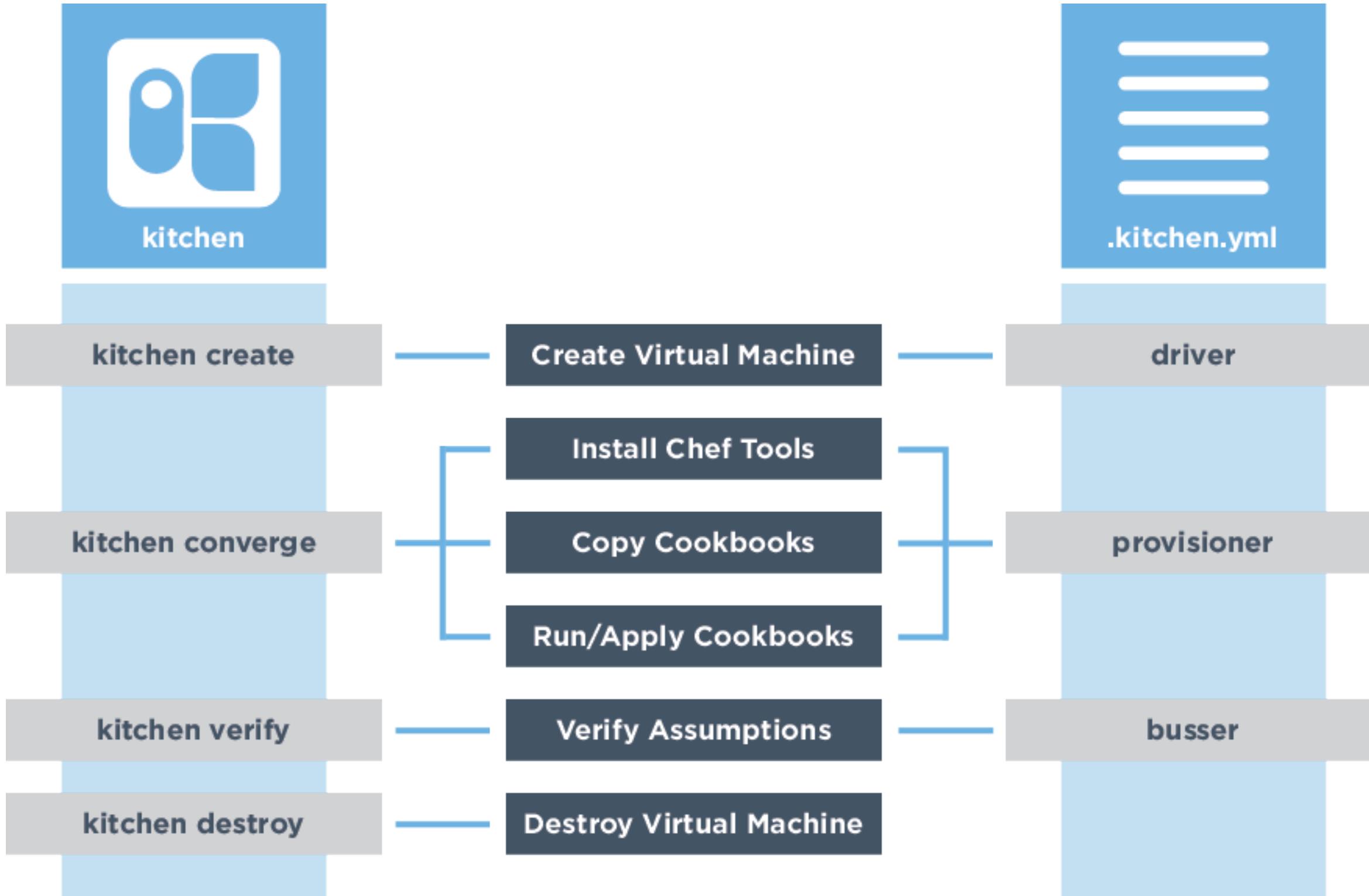
```
> chef generate cookbook cookbooks/tomcat
```

```
Compiling Cookbooks...
```

```
Recipe: code_generator::cookbook
```

```
* directory[/home/chef/cookbooks/tomcat] action create
  - create new directory /home/chef/cookbooks/tomcat
* template[/home/chef/cookbooks/tomcat/metadata.rb] action
create_if_missing
  - create new file /home/chef/cookbooks/tomcat/metadata.rb
  - update content in file
/home/chef/cookbooks/tomcat/metadata.rb from none to d6d456
  (diff output suppressed by config)
* template[/home/chef/cookbooks/tomcat/README.md] action from
```

Test Kitchen Commands and Configuration



Edit .kitchen.yml

~/cookbooks/tomcat/.kitchen.yml

```
---
```

```
driver:
```

```
  name: docker
```

```
provisioner:
```

```
  name: chef_zero
```

```
verifier:
```

```
  name: inspec
```

```
platforms:
```

```
  - name: centos-6.7
```

Verify Testkitchen



```
> kitchen list
```

Instance	Driver	Provisioner	Verifier	Transport	Last Action
default-centos-67	Docker	ChefZero	Inspec	Ssh	<Not Created>

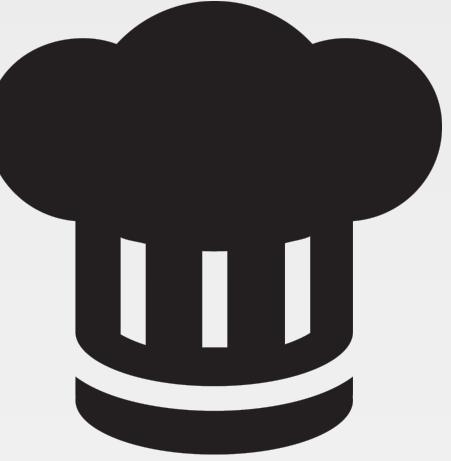
Viewing the tomcat Directory



```
> tree cookbooks/tomcat
```

```
cookbooks/tomcat/
├── Berksfile
├── chefignore
├── metadata.rb
├── README.md
├── recipes
│   └── default.rb
└── spec
    └── spec_helper.rb
10 directories, 9 files
```

EXERCISE



Learning How to Chef

*How do I convert a command within the script into a resource within Chef?
What is a resource?*

Objective:

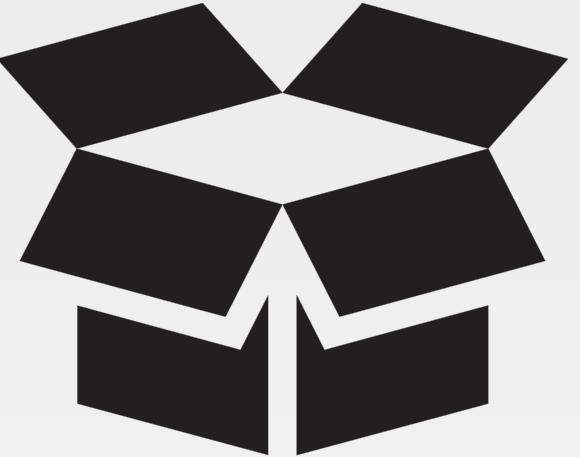
- Review the existing installation instructions
- Create a cookbook
- Write the first resource
- Apply the cookbook to the system

Install Prerequisite Packages

```
$ sudo yum install java-1.7.0-openjdk-devel
```

This installs the Java Development Kit on the system.

CONCEPT



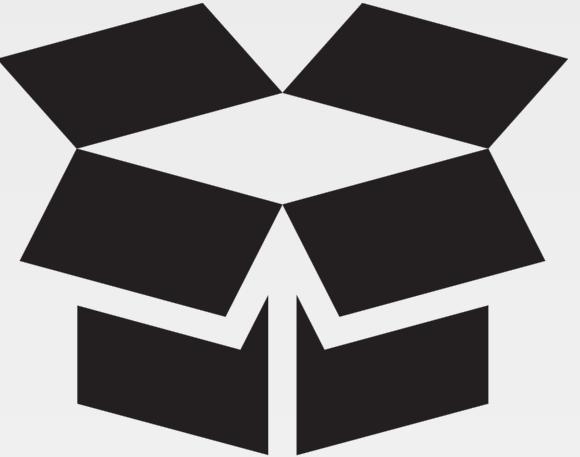
Resource

A resource is a statement of configuration policy.

It describes the desired state of an element of your infrastructure and the steps needed to bring that item to the desired state.

docs.chef.io/resources.html

CONCEPT



Resource: Package

Use the **package** resource to manage packages.

This resource is the base resource for several other resources used for package management on specific platforms. While it is possible to use each of these specific resources, it is recommended to use the **package** resource as often as possible. (e.g. `apt_package`, `yum_package`, `windows_package`)

docs.chef.io/resource_package.html

The Package Resource

```
package 'httpd' do
  action :install
end
```

The package named 'httpd' is installed.

Script

```
$ sudo yum install java-1.7.0-openjdk-devel
```

Resource

```
package 'java-1.7.0-openjdk-devel'
```

Opening the Default Recipe



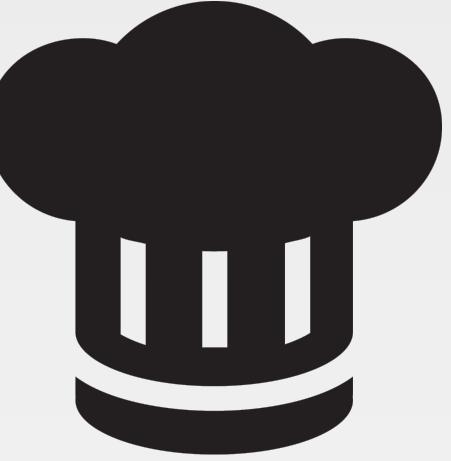
```
> $EDITOR ~/cookbooks/tomcat/recipes/default.rb
```

Adding the Package Resource to the Recipe

~/cookbooks/tomcat/recipes/default.rb

```
#  
# Cookbook Name:: tomcat  
# Recipe:: default  
#  
# Copyright (c) 2016 The Authors, All Rights Reserved.  
package 'java-1.7.0-openjdk-devel'
```

EXERCISE



Learning How to Chef

Now that I have written a resource into a recipe in a cookbook - how do I apply that change to the my system?

Objective:

- ✓ Review the existing installation instructions
- ✓ Create a cookbook
- ✓ Write the first resource
- Apply the cookbook to the system

Return to cookbook



```
> cd ~/cookbooks/tomcat
```

Converge TestKitchen



```
> kitchen converge
```

(lots of output!)

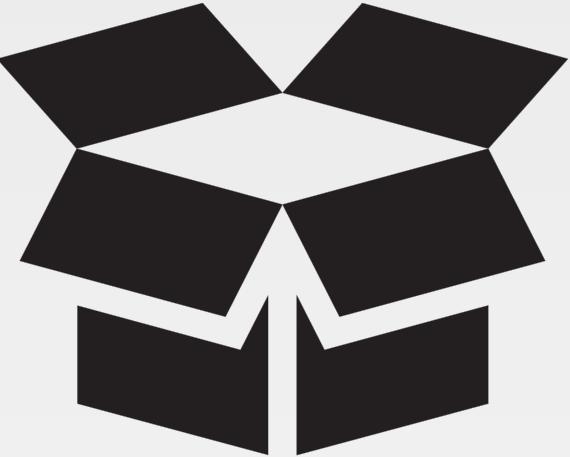
Verify TestKitchen status



```
> kitchen list
```

Instance	Driver	Provisioner	Verifier	Transport	Last Action
default-centos-67	Docker	ChefZero	Inspec	Ssh	Converged

CONCEPT



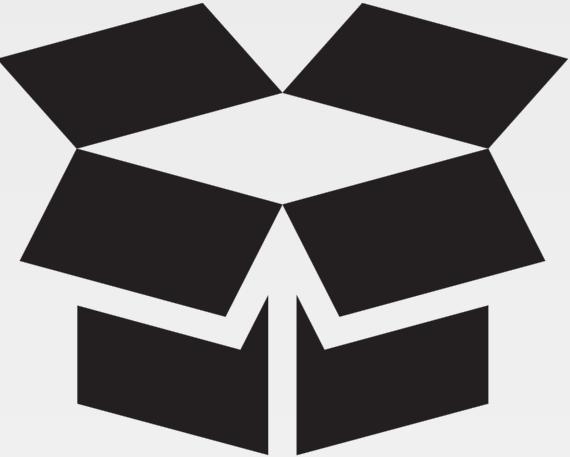
chef-client

A chef-client is an agent that runs locally on every node that is under management by Chef.

When a chef-client is run, it will perform all of the steps that are required to bring the node into the expected state.

docs.chef.io/chef_client.html

CONCEPT



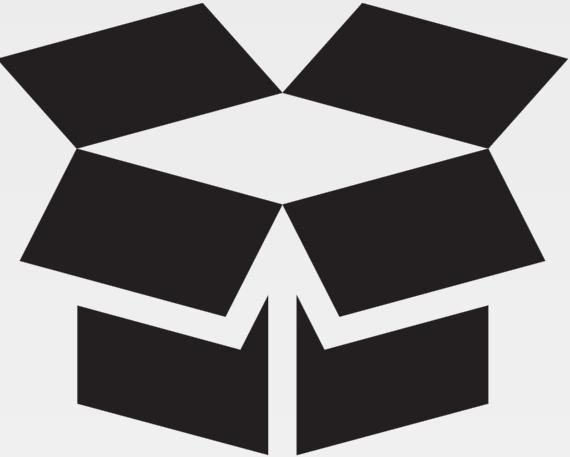
chef-client --local-mode (or -z)

chef-client's default mode attempts to contact a Chef Server and ask it for the recipes to run for the given node.

We are overriding that behavior to have it work in a local mode.

docs.chef.io/chef_client.html

CONCEPT



chef-client --runlist "recipe[COOKBOOK::RECIPE]"

In local mode, we need to provide a list of recipes to apply to the system. This is called a **run list**. A run list is an ordered collection of recipes to execute.

Each recipe in the run list must be addressed with the format **recipe[COOKBOOK NAME::RECIPE NAME]**.

docs.chef.io/chef_client.html

Applying tomcat Cookbook's default Recipe



```
> sudo chef-client --local-mode --runlist "recipe[tomcat::default]"
```

```
- tomcat (0.1.0)
```

```
Compiling Cookbooks...
```

```
Converging 1 resources
```

```
Recipe: tomcat::default
```

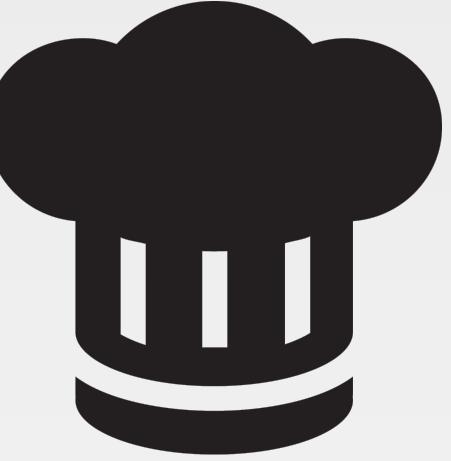
```
* yum_package[java-1.7.0-openjdk-devel] action install
  - install version 1.7.0.101-2.6.6.1.el6_7 of package java-1.7.0-openjdk-devel
```

```
Running handlers:
```

```
Running handlers complete
```

```
Chef Client finished, 1/1 resources updated in 48 seconds
```

EXERCISE



Learning How to Chef

Now I see the workflow and understand Chef a little better. What's next?

Objective:

- ✓ Review the existing installation instructions
- ✓ Create a cookbook
- ✓ Write the first resource
- ✓ Apply the cookbook to the system

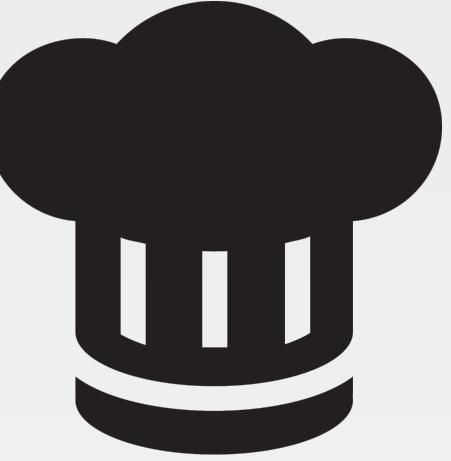
DISCUSSION



Q&A

What questions can we answer for you?

EXERCISE



Build the Recipe

Converting the first piece of the script showed the initial workflow. Now it's time to continue with the rest of the script.

Objective:

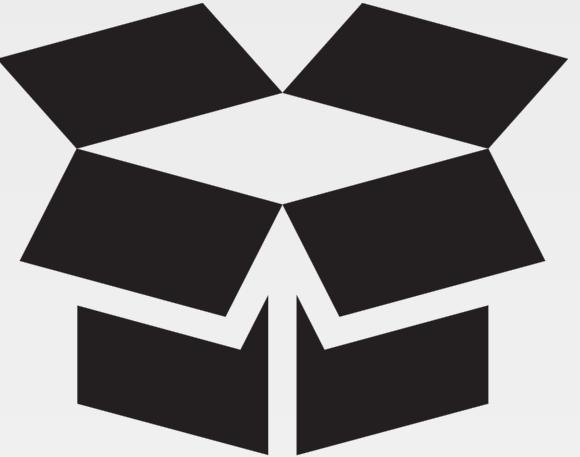
- Create required users
- Download and extract Tomcat
- Set the correct directory permissions
- Setup the Tomcat service
- Verify the site is running

Create Required Users

```
$ sudo groupadd chef  
$ sudo useradd -g chef chef
```

This creates the user that will run the Tomcat process with appropriate options.

CONCEPT



Resource: group

Use the **group** resource to manage a local group.

docs.chef.io/resource_group.html

The group Resource

```
group 'beverages' do
  action :create
end
```

The group named 'beverages' is created with members 'latte' and 'mocha'.

Script

```
$ sudo groupadd chef
```

Resource

```
group 'chef' do
  action :create
end
```

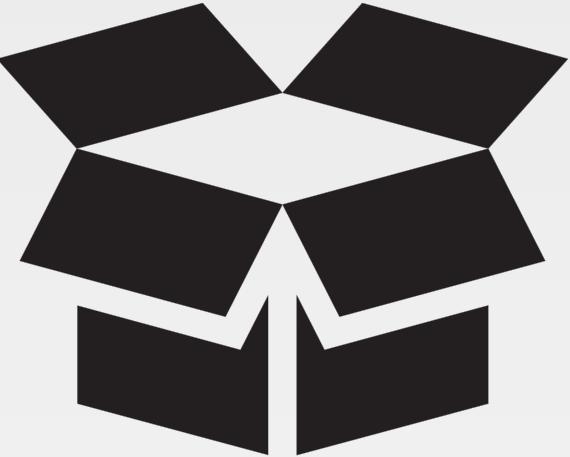
Adding the group Resource

~/cookbooks/tomcat/recipes/default.rb

```
package 'java-1.7.0-openjdk-devel'

group 'tomcat' do
  action :create
end
```

CONCEPT



Resource: user

Use the **user** resource to add users, update existing users, remove users, and to lock/unlock user passwords.

docs.chef.io/resource_user.html

The user Resource

```
user 'latte' do
  action :create
  group 'beverages'
  shell '/bin/sh'
  home '/home/latte'
end
```

The user named 'latte' is created in the group 'beverages' with the shell '/bin/sh' and the home '/home/latte'.

Script

```
$ sudo useradd -g chef chef
```

Resource

```
user 'chef' do
  group 'chef'
end
```

Adding the user Resource

~/cookbooks/tomcat/recipes/default.rb

```
package 'java-1.7.0-openjdk-devel'
```

```
group 'tomcat' do
  action :create
end
```

```
user 'chef' do
  group 'tomcat'
end
```

Converge TestKitchen



```
> kitchen converge
```

(lots of output!)

Applying tomcat Cookbook's default Recipe



```
> sudo chef-client --local-mode --runlist "recipe[tomcat::default]"
```

```
Converging 3 resources
```

```
Recipe: tomcat::default
```

```
  * yum_package[java-1.7.0-openjdk-devel] action install (up to date)
```

```
  * group[chef] action create
```

```
    - create chef
```

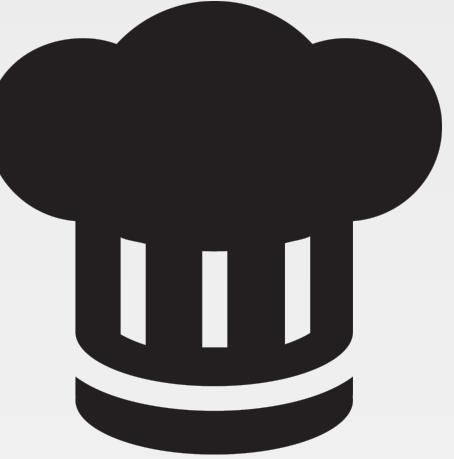
```
  * user[chef] action create
```

```
    - create user chef
```

```
Running handlers:
```

```
Chef Client finished, 2/3 resources updated in 09 seconds
```

EXERCISE



Build the Recipe

Converting the first piece of the script showed the initial workflow. Now it's time to continue with the rest of the script.

Objective:

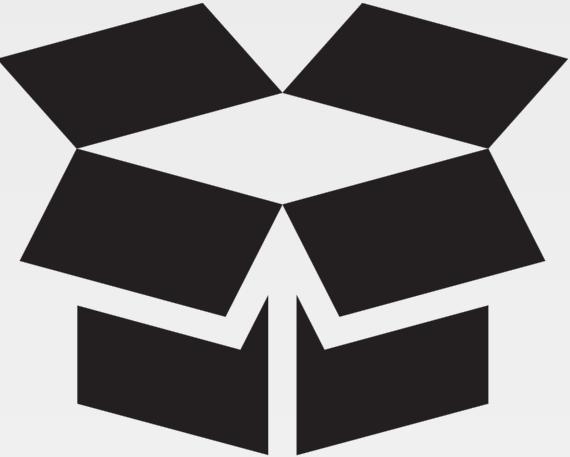
- Create require users
- Download and extract Tomcat
- Set the correct directory permissions
- Setup the Tomcat service
- Verify the site is running

Download and Extract Tomcat

```
$ cd /tmp  
$ wget http://mirrors.gigenet.com/apache/tomcat/tomcat-  
8/v8.0.43/bin/apache-tomcat-8.0.43.tar.gz  
$ sudo mkdir /opt/tomcat  
$ sudo tar xvf apache-tomcat-8*tar.gz -C /opt/tomcat --strip-  
components=1
```

We are installing Tomcat from source so we need to download it from a remote location, create a home for it and then unzip it into that new location.

CONCEPT



Resource: `remote_file`

Use the `remote_file` resource to transfer a file from a remote location using file specificity. This resource is similar to the `file` resource.

docs.chef.io/resource_remote_file.html

The `remote_file` Resource

```
remote_file '/tmp/app-archive.tar.gz' do
  source 'http://project.com/application/latest/app-archive.tar.gz'
end
```

The `remote_file` named '`/tmp/app-archive.archive.tar.gz`' is created from source '`http://project.com/application/latest/app-archive.tar.gz`'.

Script

```
$ cd /tmp  
$ wget  
http://mirror.sdunix.com/apache/tomcat/  
tomcat-8/v8.0.33/bin/apache-tomcat-  
8.0.33.tar.gz
```

Resource

```
remote_file '/tmp/apache-tomcat-  
8.0.33.tar.gz' do  
  source 'http://mirror.sdunix.com...'  
end
```

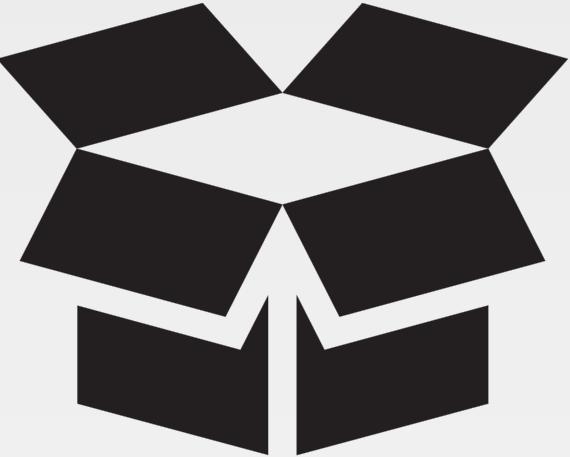
Adding the remote_file Resource

~/cookbooks/tomcat/recipes/default.rb

```
user 'chef' do
  group 'tomcat'
end

remote_file '/tmp/apache-tomcat-8.0.43.tar.gz' do
  source 'http://mirror.olnevhost.net/pub/apache/tomcat/tomcat-
8/v8.0.43/bin/apache-tomcat-8.0.43.tar.gz'
end
```

CONCEPT



Resource: directory

Use the directory resource to manage a directory, which is a hierarchy of folders that comprises all of the information stored on a computer. The root directory is the top-level, under which the rest of the directory is organized.

The directory resource uses the name property to specify the path to a location in a directory. Typically, permission to access that location in the directory is required.

docs.chef.io/resource_directory.html

The directory Resource

```
directory '/opt/application/conf' do
  action :create
  recursive true
end
```

The directory named '/opt/application/conf' is created recursively.

Script

```
$ sudo mkdir /opt/tomcat
```

Resource

```
directory '/opt/tomcat' do
  action :create
  recursive true
end
```

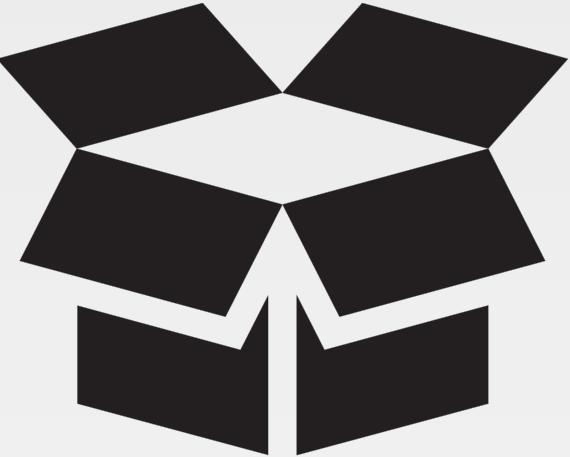
Adding the directory Resource

~/cookbooks/tomcat/recipes/default.rb

```
remote_file '/tmp/apache-tomcat-8.0.33.tar.gz' do
  source 'http://mirror.sdunix.com/apache/tomcat/tomcat-
8/v8.0.33/bin/apache-tomcat-8.0.33.tar.gz'
end
```

```
directory '/opt/tomcat' do
  action :create
  recursive true
end
```

CONCEPT



Resource: execute

Use the execute resource to execute a single command. Commands that are executed with this resource are (by their nature) not idempotent, as they are typically unique to the environment in which they are run. Use `not_if` and `only_if` to guard this resource for idempotence.

docs.chef.io/resource_execute.html

The execute Resource

```
execute 'extract_archive' do
  command 'tar xvf archive.tar.gz'
  cwd '/tmp'
end
```

The execute resource named 'extract_archive' is run with the command 'tar xvf archive.tar.gz' in the cwd '/tmp'.

All resources have default actions. When an action is not provided the default action is assumed. **For the execute resource the default action is run.**

Script

```
$ sudo tar xvf apache-tomcat-8*tar.gz -C /opt/tomcat --strip-components=1
```

Resource

```
execute 'extract_tomcat' do
  command 'tar xvf apache-tomcat-8...'
  cwd '/tmp'
end
```

Adding the execute Resource

~/cookbooks/tomcat/recipes/default.rb

```
directory '/opt/tomcat' do
  action :create
end

execute 'extract_tomcat' do
  command 'tar xvf apache-tomcat-8*tar.gz -C /opt/tomcat --strip-
components=1'
  cwd '/tmp'
end
```

Converge TestKitchen



```
> kitchen converge
```

(lots of output!)

Applying tomcat Cookbook's default Recipe



```
> sudo chef-client --local-mode --runlist "recipe[tomcat::default]"
```

```
Converging 6 resources
```

```
Recipe: tomcat::default
```

```
  * yum_package[java-1.7.0-openjdk-devel] action install (up to date)

  * group[tomcat] action create (up to date)

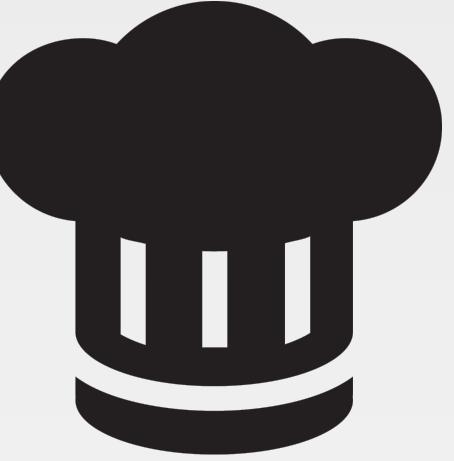
  * user[tomcat] action create (up to date)

  * remote_file[/tmp/apache-tomcat-8.0.33.tar.gz] action create (up to date)

  * directory[/opt/tomcat] action create (up to date)

  * execute[extract_tomcat] action run
    - execute tar xvf apache-tomcat-8*tar.gz -C /opt/tomcat --
```

EXERCISE



Build the Recipe

Converting the first piece of the script showed the initial workflow. Now it's time to continue with the rest of the script.

Objective:

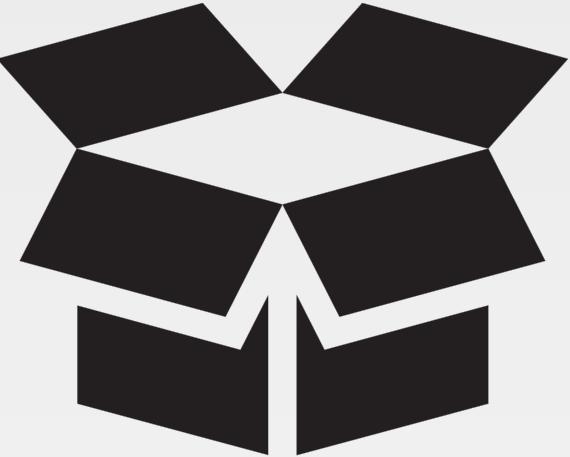
- ✓ Create require users
- ✓ Download and extract Tomcat
- Set the correct directory permissions
- Setup the Tomcat service
- Verify the site is running

Set the Correct Directory Permissions

```
$ cd /opt/tomcat  
$ sudo chgrp -R tomcat conf  
$ sudo chmod g+rwx conf  
$ sudo chmod g+r conf/*  
$ sudo chown -R chef webapps/ work/ temp/ logs/ conf/
```

The Tomcat directory needs to be setup with the correct permissions and owners for the application to work correctly.

CONCEPT



Resource: directory

A directory may have an owner, group, mode (rights on Windows) specified as attributes.

The default action for the directory resource is create.

docs.chef.io/resource_directory.html

Script

```
$ cd /opt/tomcat  
$ sudo chgrp -R tomcat conf  
$ sudo chmod g+rwx conf
```

Resource

```
execute 'chgrp -R tomcat  
/opt/tomcat/conf'  
  
directory '/opt/tomcat/conf' do  
  group 'tomcat'  
  mode '0474'  
end
```

Adding the execute Resources

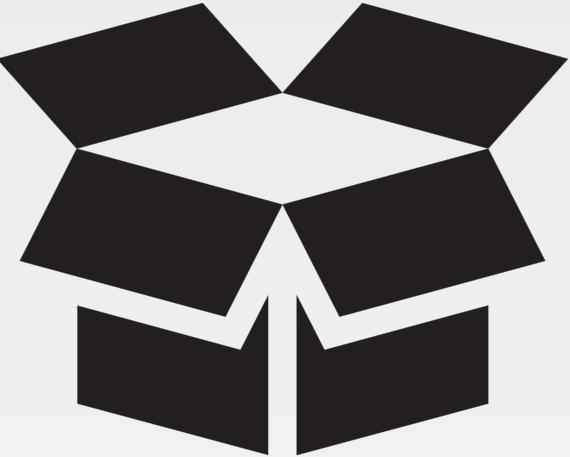
~/cookbooks/tomcat/recipes/default.rb

```
execute 'extract_tomcat' do
  command 'tar xvf apache-tomcat-8*tar.gz -C /opt/tomcat --strip-
components=1'
  cwd '/tmp'
end
```

```
execute 'chgrp -R tomcat /opt/tomcat/conf'

directory '/opt/tomcat/conf' do
  group 'tomcat'
  mode '0474'
end
```

CONCEPT



Resource: execute

The name of the execute resource can also be the command. This is often times the choice with shorter or clearer commands.

docs.chef.io/resource_execute.html

Script

```
$ cd /opt/tomcat  
$ sudo chmod g+r conf/*  
$ sudo chown -R tomcat webapps/ work/  
temp/ logs/
```

Resource

```
execute 'chmod g+r conf/*' do  
  cwd '/opt/tomcat'  
end  
  
execute 'chown -R chef webapps/ work/  
temp/ logs/ conf/' do  
  cwd '/opt/tomcat'  
end
```

NOTE: Even the current working directory property (cwd) is not needed if the command is provided the entire path to the location of target.

```
execute 'chmod g+r /opt/tomcat/conf/*'
```

Adding the execute Resources

~/cookbooks/tomcat/recipes/default.rb

```
directory '/opt/tomcat/conf' do
  group 'chef'
  mode '0474'
end

execute 'chmod g+r conf/*' do
  cwd '/opt/tomcat'
end

execute 'chown -R chef webapps/ work/ temp/ logs/ conf/' do
  cwd '/opt/tomcat'
end
```

Converge TestKitchen



```
> kitchen converge
```

(lots of output!)

Applying tomcat Cookbook's default Recipe



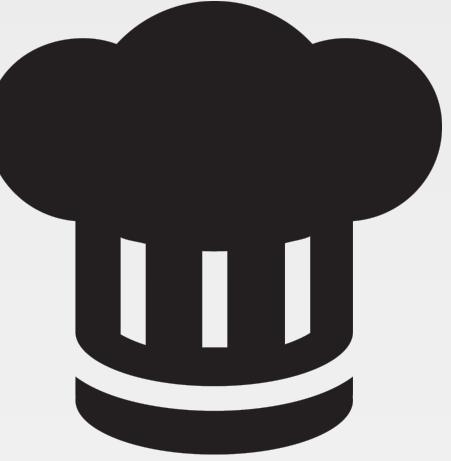
```
> sudo chef-client --local-mode --runlist "recipe[tomcat::default]"
```

```
* directory[/opt/tomcat/conf] action create
  - change mode from '0755' to '0474'
  - change group from 'root' to 'tomcat'
* execute[chmod g+r conf/*] action run
  - execute chmod g+r conf/*
* execute[chown -R tomcat webapps/ work/ temp/ logs/] action run
  - execute chown -R tomcat webapps/ work/ temp/ logs/
```

Running handlers:

Chef Client finished, 4/9 resources updated in 12 seconds

EXERCISE



Build the Recipe

Converting the first piece of the script showed the initial workflow. Now it's time to continue with the rest of the script.

Objective:

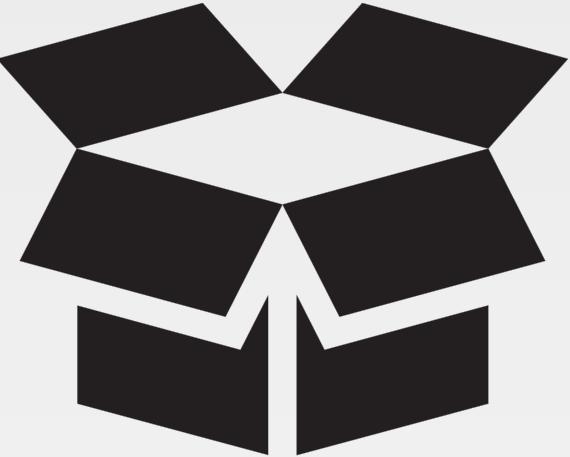
- ✓ Create require users
- ✓ Download and extract Tomcat
- ✓ Set the correct directory permissions
- Setup the Tomcat service
- Verify the site is running

Setting up the Tomcat Service

```
$ sudo vi /etc/init.d/tomcat8  
$ sudo service tomcat8 start  
$ sudo chkconfig tomcat8 on
```

The Tomcat application needs to have the service file created and then have it started to ensure that when the machine reboots that it starts again.

CONCEPT



Resource: template

A cookbook template is an Embedded Ruby (ERB) template that is used to dynamically generate static text files. Templates may contain Ruby expressions and statements, and are a great way to manage configuration files. Use the template resource to add cookbook templates to recipes; place the corresponding Embedded Ruby (ERB) template file in a cookbook's /templates directory.

docs.chef.io/resource_template.html

Script

```
$ sudo vi  
/etc/systemd/system/tomcat.service
```

Resource

```
template  
'/etc/systemd/system/tomcat.service' do  
  source 'tomcat.service.erb'  
end
```

Creating a Tomcat Service Template File



```
> chef generate template cookbooks/tomcat tomcat8
```

Compiling Cookbooks...

```
Recipe: code_generator::template
  * directory[cookbooks/tomcat/templates/default] action create
    - create new directory cookbooks/tomcat/templates/default
  * template[cookbooks/tomcat/templates/default/tomcat8.erb]
action create
  - create new file
cookbooks/tomcat/templates/default/tomcat8.erb
  - update content in file
cookbooks/tomcat/templates/default/tomcat8.erb from none to e3b0c4
  (diff output suppressed by config)
```

Editing the Tomcat Service Template File



```
> $EDITOR cookbooks/tomcat/templates/tomcat8.erb
```

Adding the Contents to the Template File

~/cookbooks/tomcat/templates/default/tomcat8.erb

<http://goo.gl/iChgiJ>

```
#!/bin/bash
# description: Tomcat Start Stop Restart
# processname: tomcat
# chkconfig: 234 20 80
JAVA_HOME=/usr/java/jdk1.7.0_60
export JAVA_HOME
PATH=$JAVA_HOME/bin:$PATH
export PATH
CATALINA_HOME=/usr/share/apache-tomcat-8.0.8

case $1 in
start)
sh $CATALINA_HOME/bin/startup.sh
```

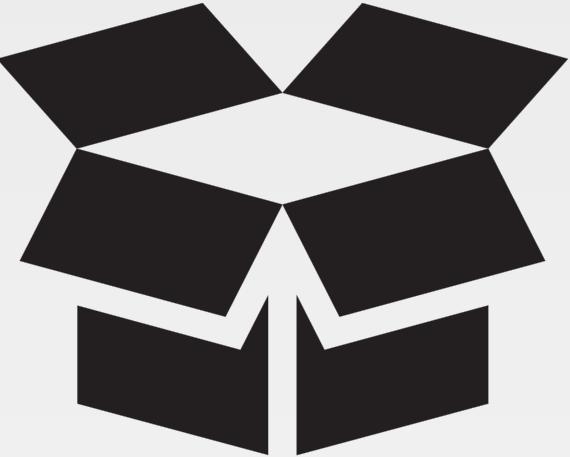
Adding the template Resource

~/cookbooks/tomcat/recipes/default.rb

```
execute 'chown -R tomcat webapps/ work/ temp/ logs/ conf/ ' do
  cwd '/opt/tomcat'
end
```

```
template '/etc/init.d/tomcat8' do
  source 'tomcat8.erb'
  mode '0755'
end
```

CONCEPT



Resource: execute

The command to execute requires only the command. No additional properties and uses the default action.

When any resource relies on the default values of the properties and the default action you do not have to append the `do . . . end` block to the resource.

docs.chef.io/resource_execute.html

Script

```
$ sudo service tomcat8 start
```

Resource

```
service 'tomcat8' do
  action [ :start ]
end
```

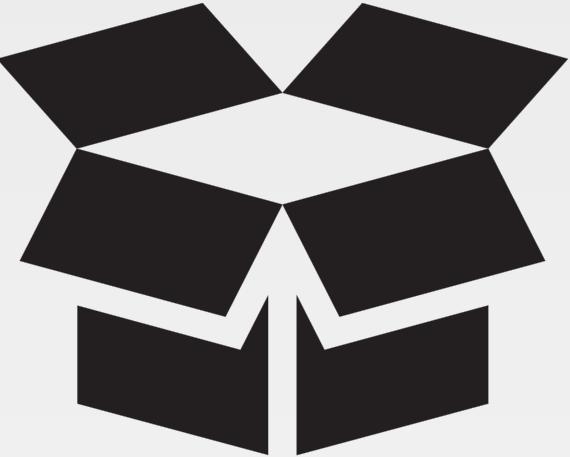
Adding the execute Resource

~/cookbooks/tomcat/recipes/default.rb

```
template '/etc/systemd/system/tomcat.service' do
  source 'tomcat.service.erb'
end

execute '/etc/init.d/tomcat8 start'
```

CONCEPT



Resource: service

Use the service resource to manage a service.

A resource can be provided more than one action. This is not often necessary for most resources except for the service resource.

docs.chef.io/resource_service.html

Script

```
$ sudo systemctl start tomcat  
$ sudo systemctl enable tomcat
```

Resource

```
service 'tomcat' do  
  action [:start, :enable]  
end
```

Adding the service Resource

~/cookbooks/tomcat/recipes/default.rb

```
template '/etc/systemd/system/tomcat.service' do
  source 'tomcat.service.erb'
end

execute '/etc/init.d/tomcat8 start'
```

Converge TestKitchen



```
> kitchen converge
```

(lots of output!)

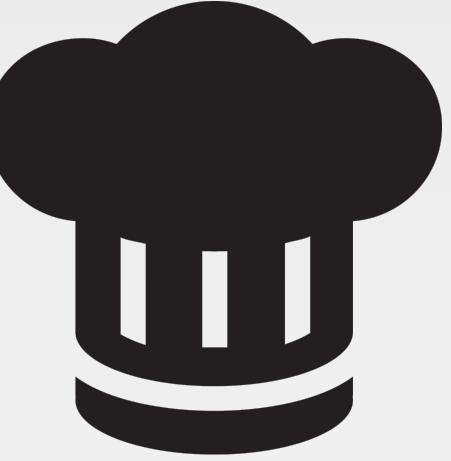
Applying tomcat Cookbook's default Recipe



```
> sudo chef-client --local-mode --runlist "recipe[tomcat::default]"
```

```
* template[/etc/systemd/system/tomcat.service] action create
  - create new file /etc/systemd/system/tomcat.service
  - update content in file /etc/systemd/system/tomcat.service
from none to 1c1c1c
  --- /etc/systemd/system/tomcat.service      2016-05-03
18:03:35.247480902 +0000
  +++ /etc/systemd/system/.tomcat.service20160503-9371-10s8llh
  2016-05-03 18:03:35.246480902 +0000
@@ -1 +1,23 @@
+[Unit]
+Description=Apache Tomcat Web Application Container
```

EXERCISE



Build the Recipe

Converting the first piece of the script showed the initial workflow. Now it's time to continue with the rest of the script.

Objective:

- ✓ Create require users
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Verify that Tomcat is Running

```
$ curl http://localhost:8080
```

When the system is configured Tomcat should be running and available on the machine.

Let's write a test!



```
> $EDITOR ~/cookbooks/tomcat/test/recipes/default_test.rb
```

Writing a test for tomcat

```
~/cookbooks/tomcat/test/recipes/default_test.rb
```

```
unless os.windows?

describe user('root') do
  it { should exist }
  skip 'This is an example test, replace with your own test.'
  end
end
```

```
describe port(8080) do
  it { should be_listening }
end
```

Converge TestKitchen



```
> kitchen verify
```

```
-----> Starting Kitchen (v1.11.1)----->
Verifying <default-centos-67>...
Use `/home/chef/cookbooks/tomcat/test/recipes/default` for testing

Target: ssh://kitchen@localhost:32770

  ○ User root should exist; User root This is an example test, r... (1
skipped)      This is an example test, replace with your own test.

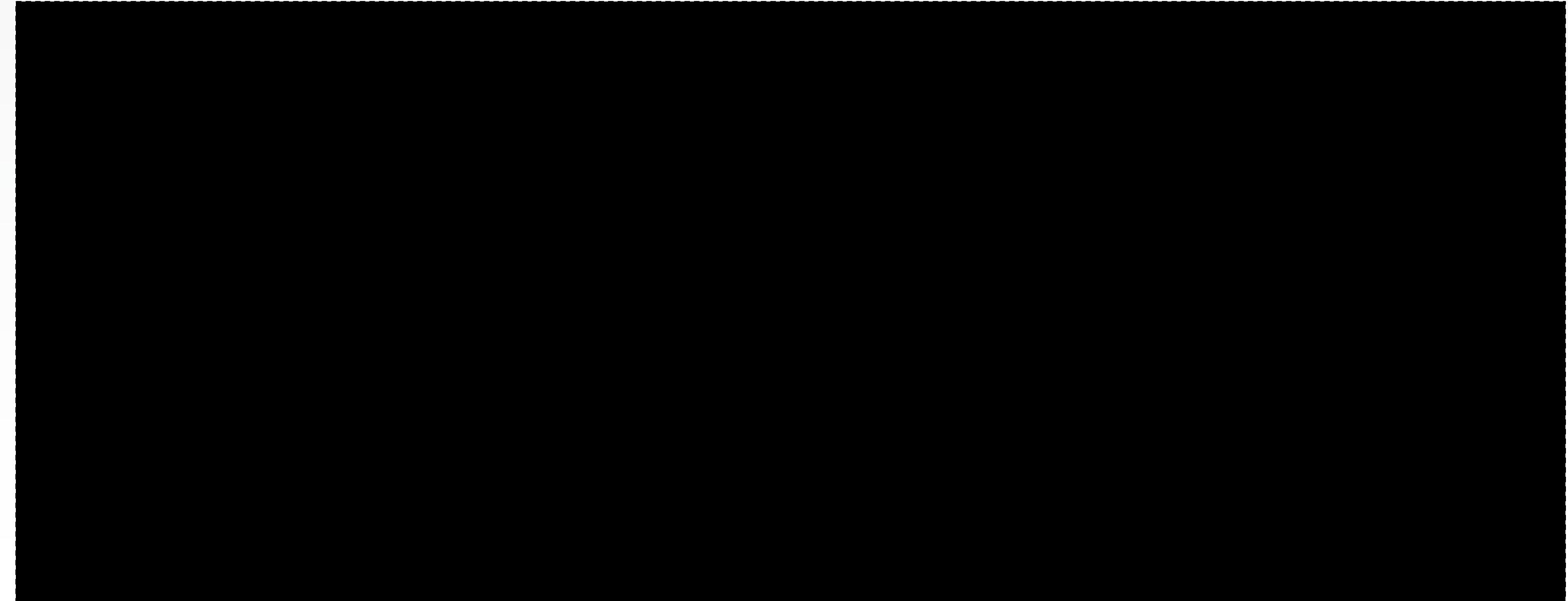
  ✓ Port 8080 should be listening

Summary: 2 successful, 0 failures, 1 skipped
Finished verifying <default-centos-67> (0m0.75s).
-----> Kitchen is finished. (0m2.54s)
```

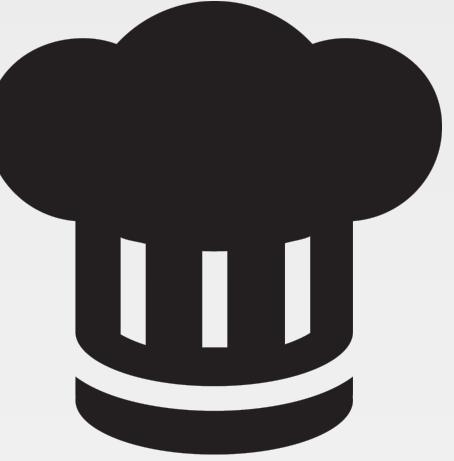
Verifying that Tomcat is Running on port 8080



```
> curl http://localhost:8080
```



EXERCISE



Build the Recipe

Converting the first piece of the script showed the initial workflow. Now it's time to continue with the rest of the script.

Objective:

- ✓ Create require users
- ✓ Download and extract Tomcat
- ✓ Set the correct directory permissions
- ✓ Setup the Tomcat service
- ✓ Verify the site is running

Agenda

- ✓ Introductions
- ✓ Setup Workstation
- ✓ Convert Script to a Recipe
- ❑ Questions and Wrap-Up



DISCUSSION



Q&A

What questions can we answer for you?

MOTIVATION



Learn Chef

This resource contains tutorials, videos, articles, documentation, and access to training that will increase your skills and knowledge of Chef.

learn.chef.io

learn.chef.io/skills/joy-of-automating-episode-1

Agenda

- ✓ Introductions
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- ✓ Convert Script to a Recipe
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