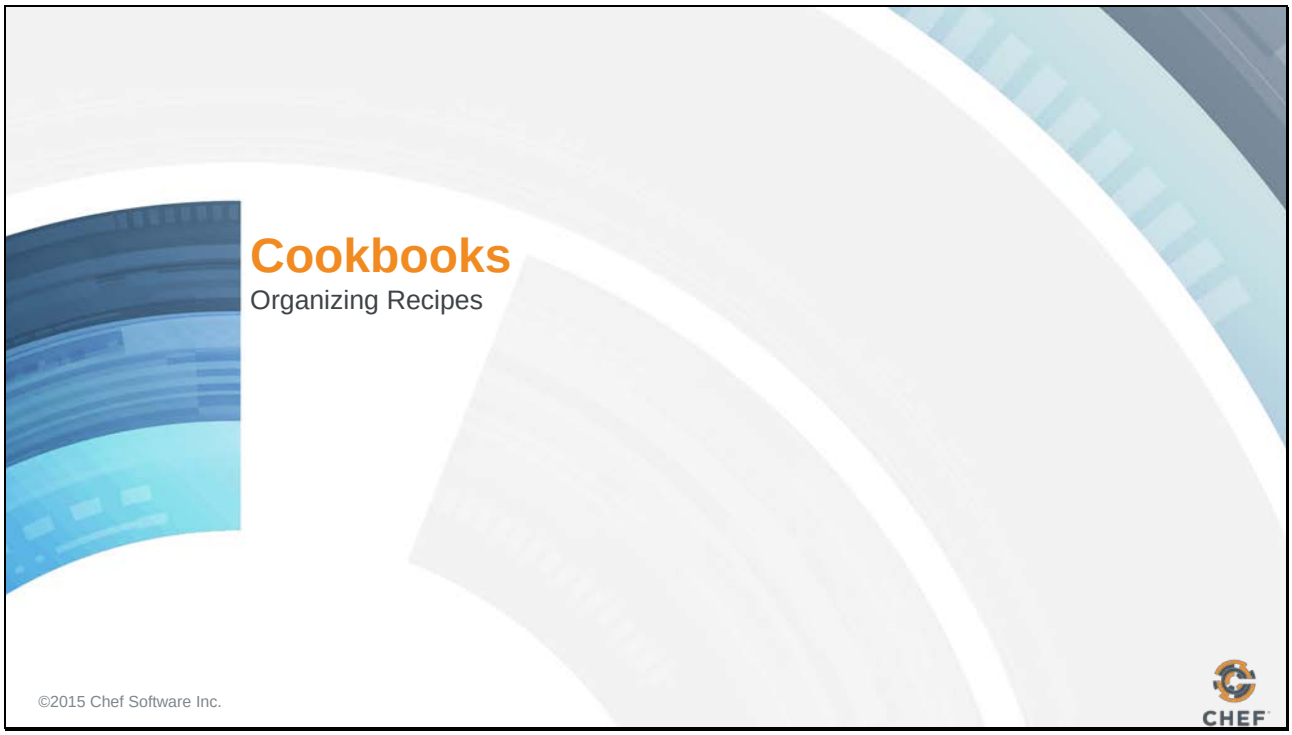
3: Cookbooks



Slide 2

Objectives

After completing this module, you should be able to:

- Modify a recipe
- Use version control
- Generate a Chef cookbook
- Define a Chef recipe that sets up a web server

CHEF

In this module you will learn how to modify a recipe, use version control, generate a Chef cookbook and define a Chef recipe that sets up a web server.

Slide 3

Questions You May Have

1. Thinking about the workstation recipe, could we do something like that for a web server?
2. Is there a way to package up recipes you create with a version number (and maybe a README)?
3. I think `chef` is able to generate something called a cookbook. Shouldn't we start thinking about some version control so we don't lose all our hard work?

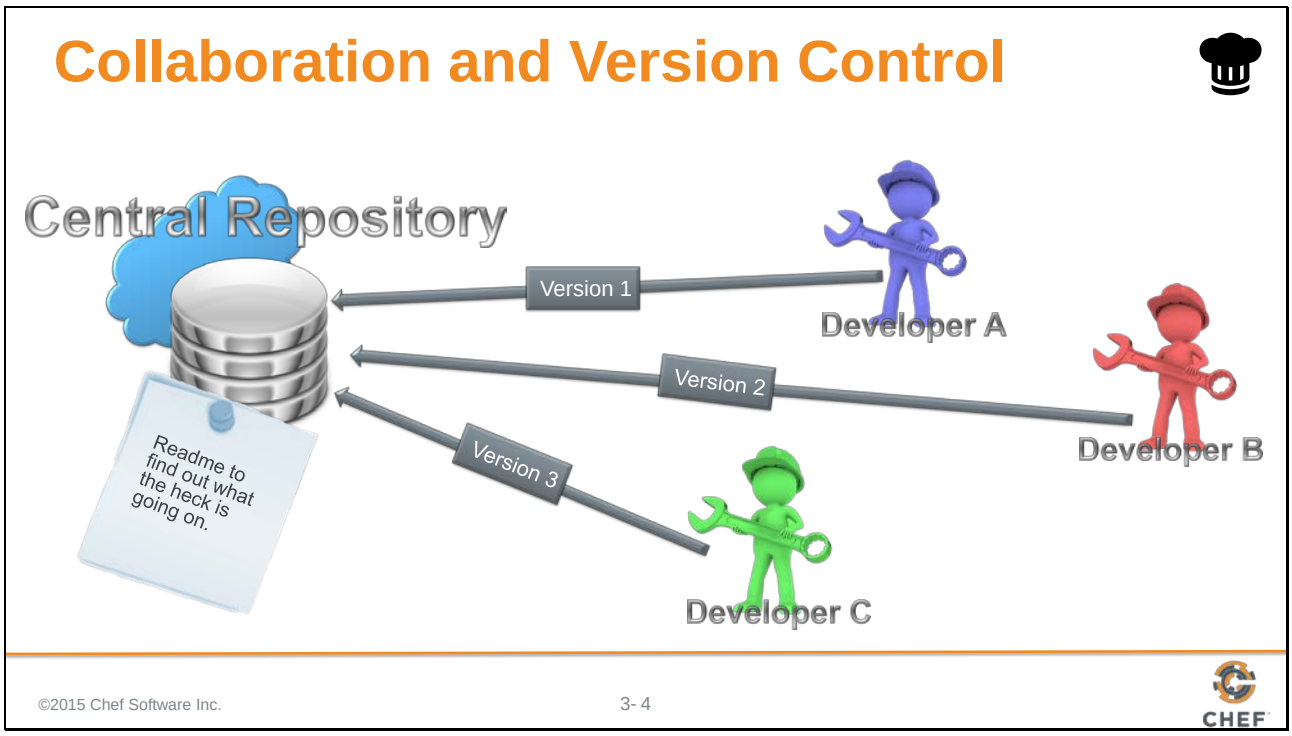
Answers:

1. The recipe that you put together to setup the workstation proved useful--useful enough to see if the same could be done with a webserver. It's a package, a file, and a service. Everything you've already completed. Well, almost everything.

2. Now the request to add version control and a README would definitely make it easier to share the recipes that we create. Without version control we'd have no way to build this software collaboratively or recover our work. Without a README no one would know what the recipe even was suppose to do or what it did.

3. And yes, before we start creating more recipes and cookbooks, we should choose a versioning solution.

Slide 4



Before we answer that question, let's talk about collaboration. Usually, none of us work in a vacuum, and it's important that systems are in place to make collaboration easier. One such system is versioning. Versioning will make it easier to share the recipes that we create.

A versioning system should include:

- A Central Repository into which all the developers publish their work.
- Each revision should be stored as a new version.
- For each change, a commit message should be added so that everyone knows what has or has not been changed.

Slide 5

Versioning Pros and Cons

```
$ cp setup.rb setup.rb.bak
or
$ cp foo{,.`date +%Y%m%d%H%M`}
or
$ cp foo{,.`date +%Y%m%d%H%M`-`$USER`}
```

Saving a copy of the original file as another filename.

Lets explore this first option of renaming the file by adding a quick extension, like in the first example shown here. In this way we can keep working on the original file as we add more features. As a group lets talk about the pros and cons of using this strategy.

So obviously a single backup won't do. We need backups more often as we are going to be iterating quickly.

We could use the current date and time down to the minute like in the second example. As a group lets talk about the pros and cons of using this strategy.

Would adding the user's name to the end of the file, like in the third example, solve the problems we are facing with other choices? Again what are the pros and cons of this new approach?

Slide 6

Git Version Control

git is a distributed revision control system with an emphasis on speed, data integrity, and support for distributed, non-linear workflows.

We will be using **git** throughout the rest of this course.

How about we use git?

What are the pros and cons of this approach?

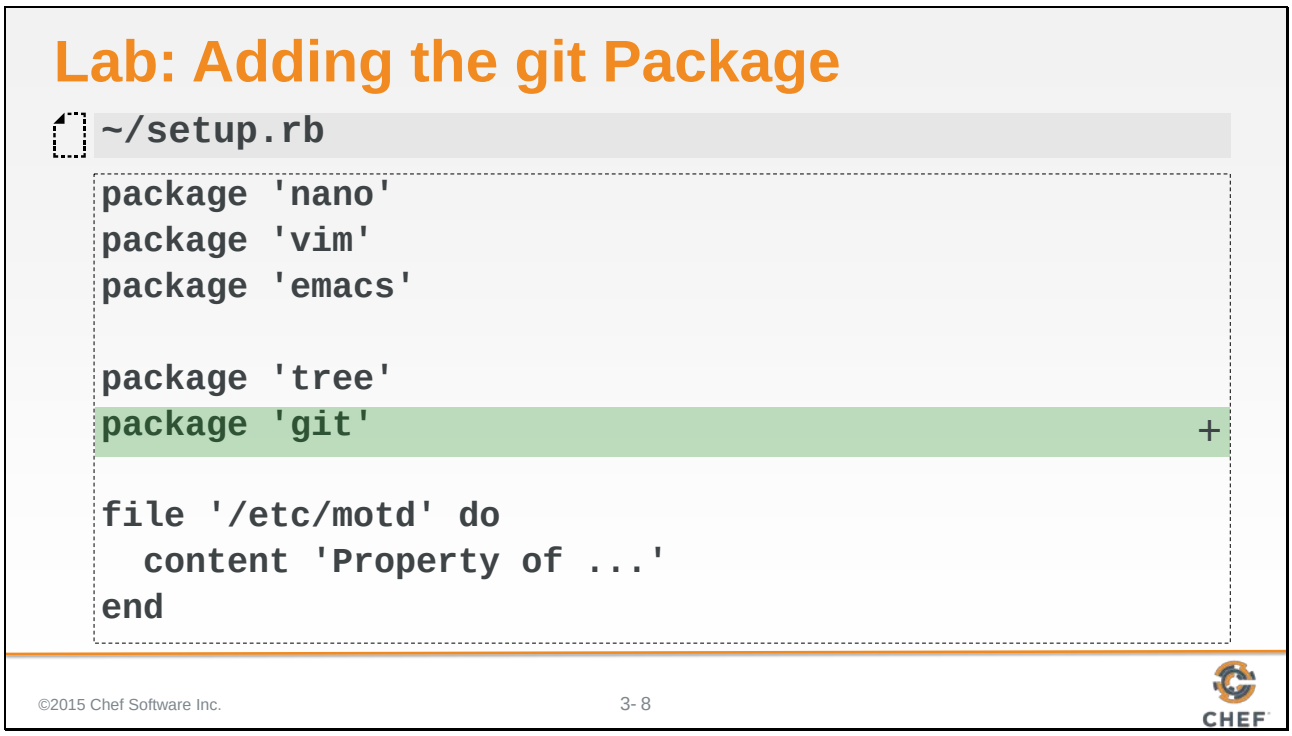
For the rest of this course we will be using git. This may not be the version control software you use on your teams or within your organization and that is alright. Our use of git within this course is used solely to demonstrate the use of version control when developing Chef code. When you develop with Chef you are welcome to use the version control system of your choice.

Slide 7

Is git installed? Do we know if it will be installed with every new instance that is setup?

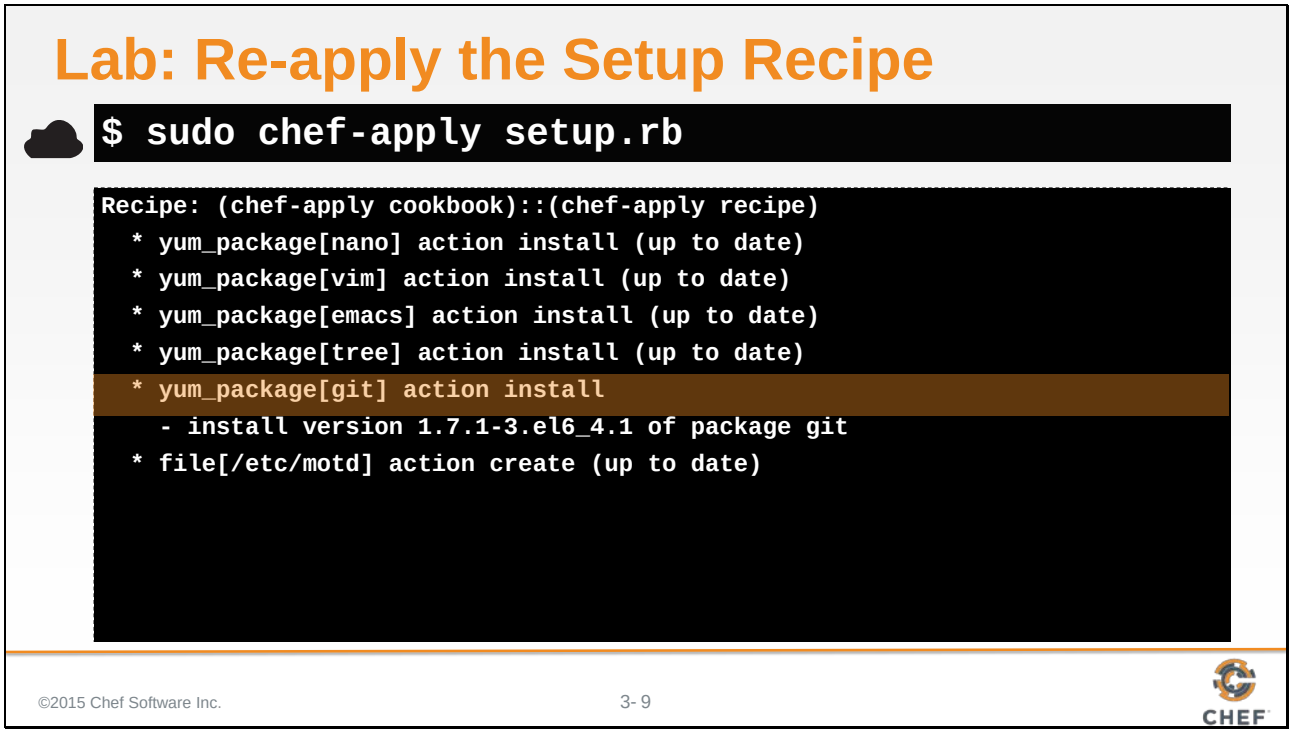
It sounds like we need the tool now to store our cookbook but we also want to define a policy that git is installed on all of our workstations. Update the setup recipe to define the new policy and apply the setup recipe again.

Slide 8



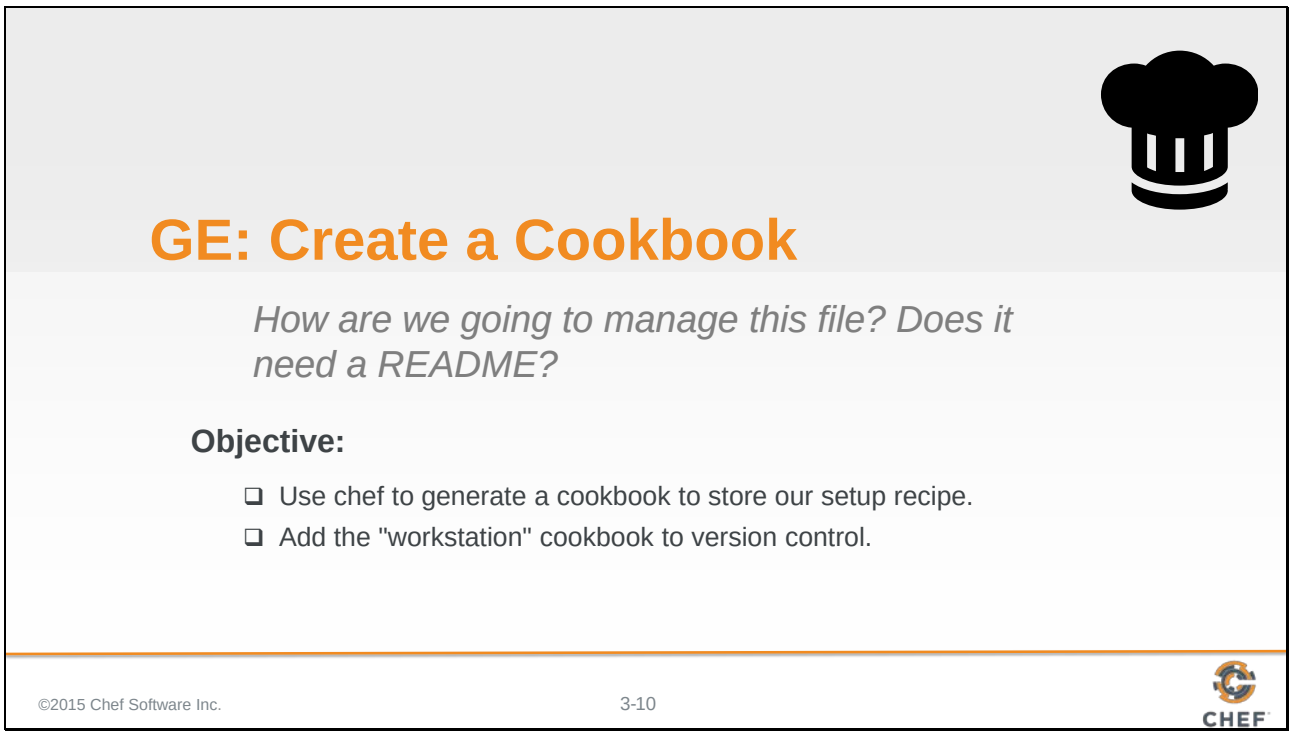
We add a package resource named 'git' to the setup recipe within our setup recipe.

Slide 9



Then we use chef-apply to apply our recipe.

Slide 10

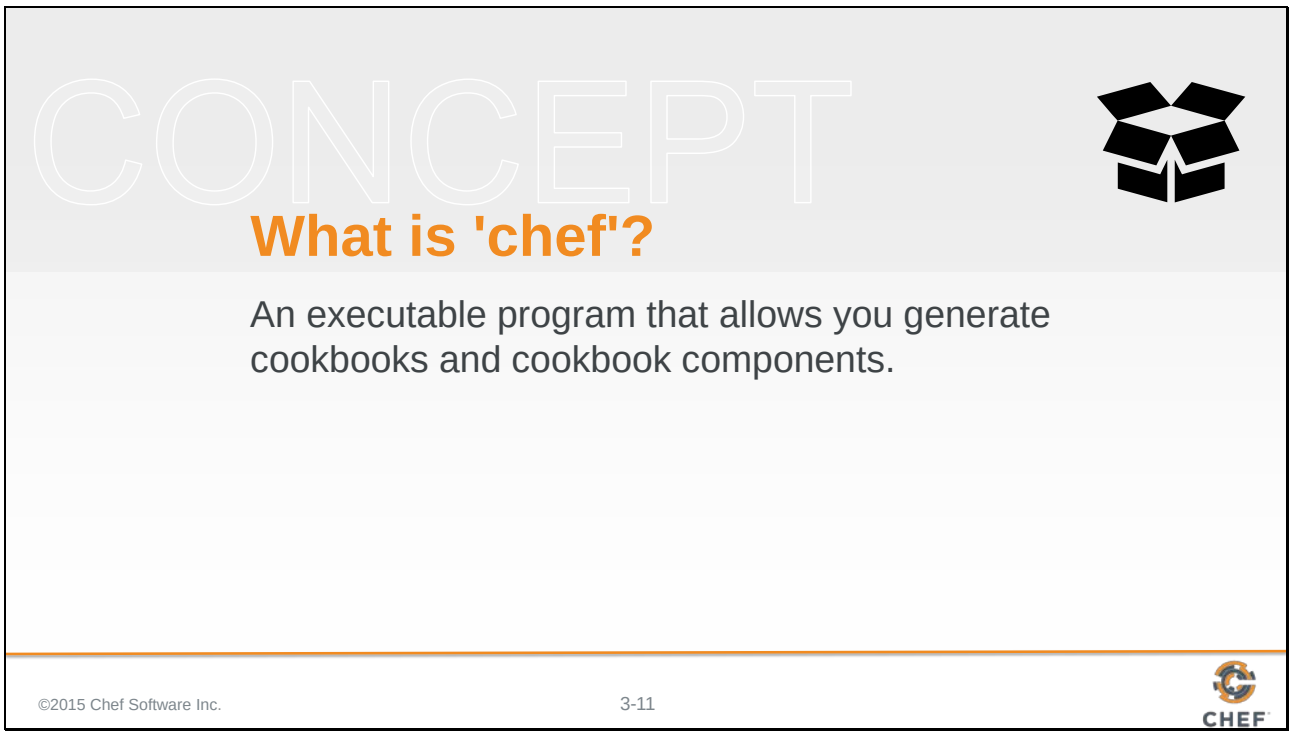


The setup recipe now installs everything we currently need on our workstation.

But before throw this recipe file into a directory with our other scripts we should look at a concept in Chef called a cookbook.

What is a cookbook? How do we create one? Let's ask 'chef'.

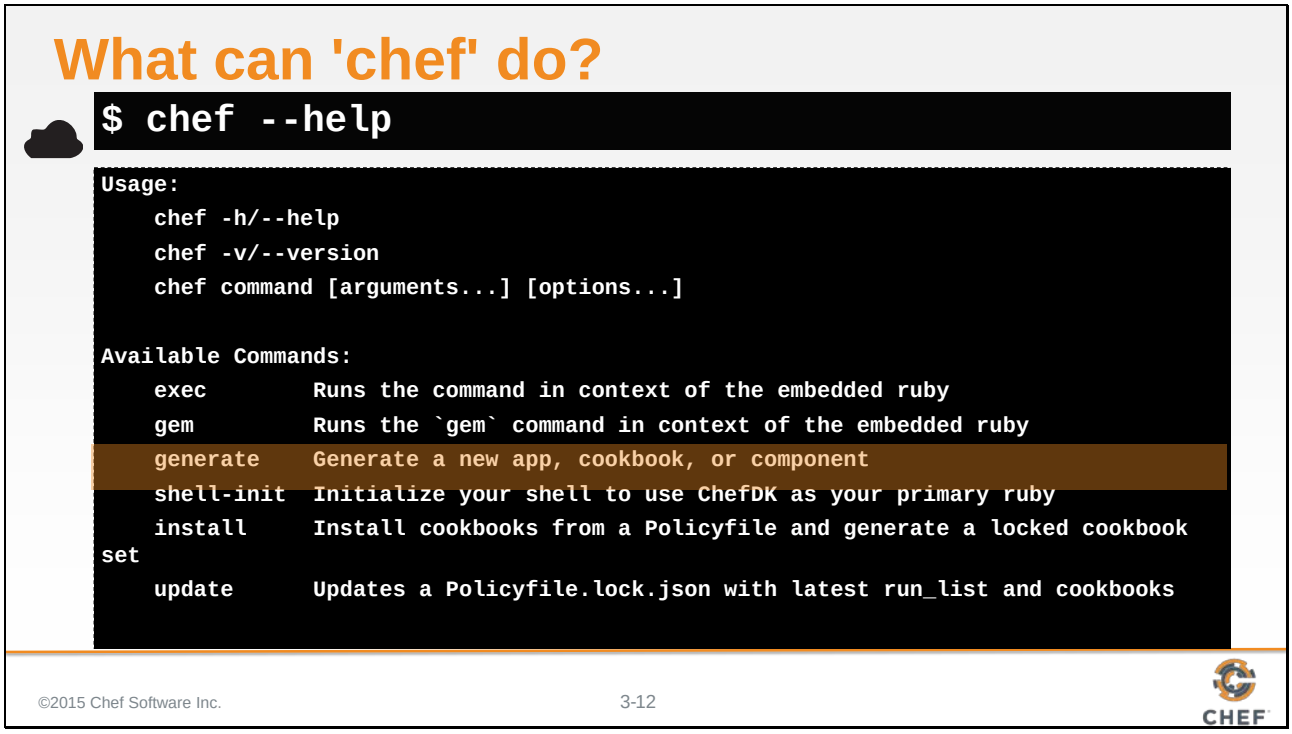
Slide 11



In this context, 'chef' is a command, not the company.

What's the best way to learn Chef? Use Chef. We want you to literally run 'chef'.

Slide 12



'chef' is a command-line application that does quite a few things. The most important thing to us right now is its ability to generate cookbooks and components.

Alright. So 'chef' can generate a cookbook. But what is the purpose of a cookbook? That sounds like we should read the documentation.

Slide 13

Cookbooks

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

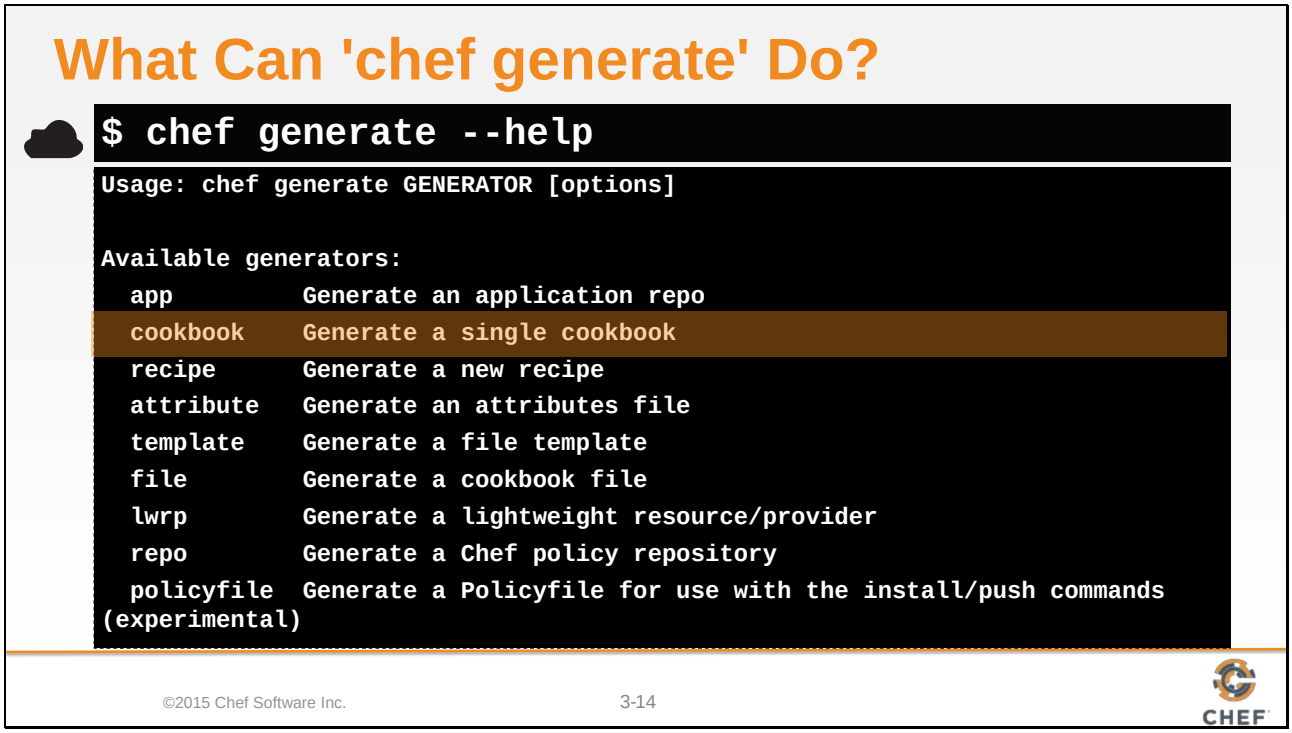
Each cookbook defines a scenario, such as everything needed to install and configure MySQL, and then it contains all of the components that are required to support that scenario.

Read the first three paragraphs here: http://docs.chef.io/cookbooks.html

It's important that you learn to read the Chef documentation. Lets look up cookbooks in Chef's documentation. Visit the docs page on cookbooks and read the first three paragraphs.

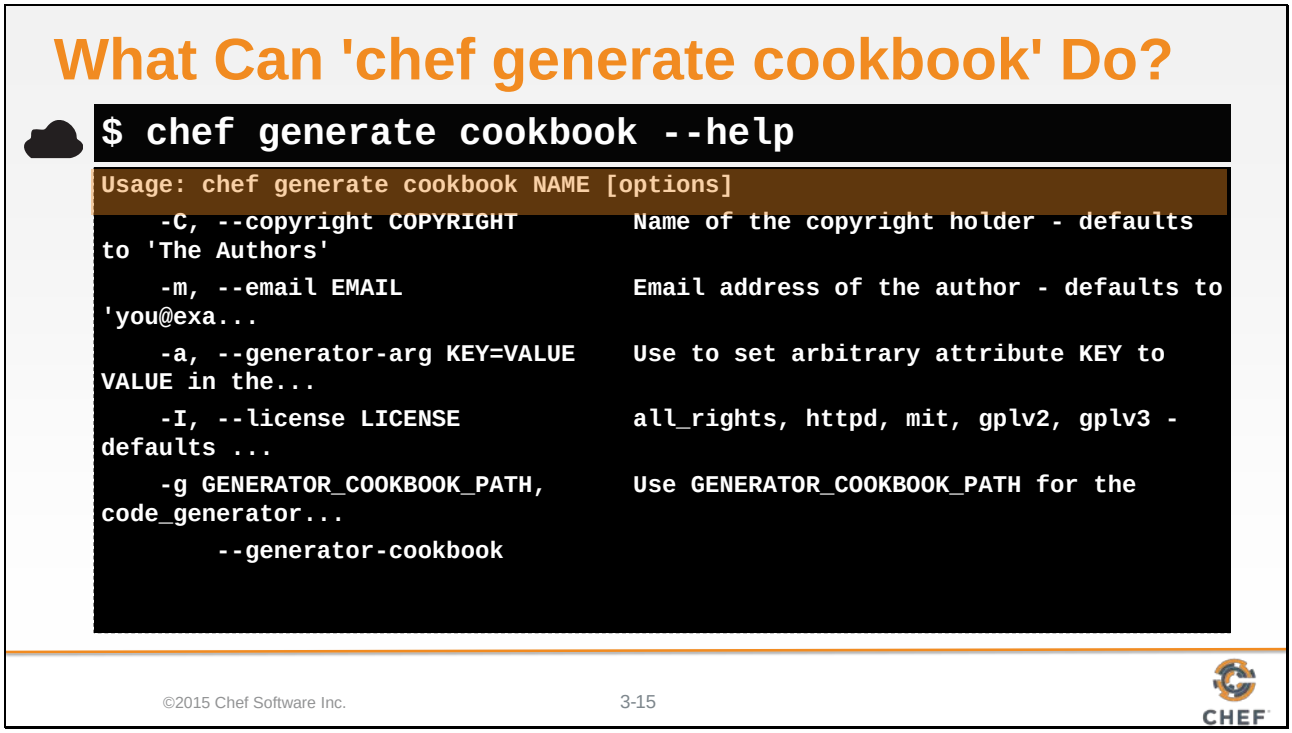
A cookbook is a structure that contains recipes. It also contains a number of other things--but right now we are most interested in a finding a home for our recipes, giving them a version, and providing a README to help describe them.

Slide 14



Lets examine the '`chef generate`' command. We can see that the command is capable of generating a large number of different things for us. It looks like if we want to generate a cookbook we're going to need to use 'chef generate cookbook'.

Slide 15

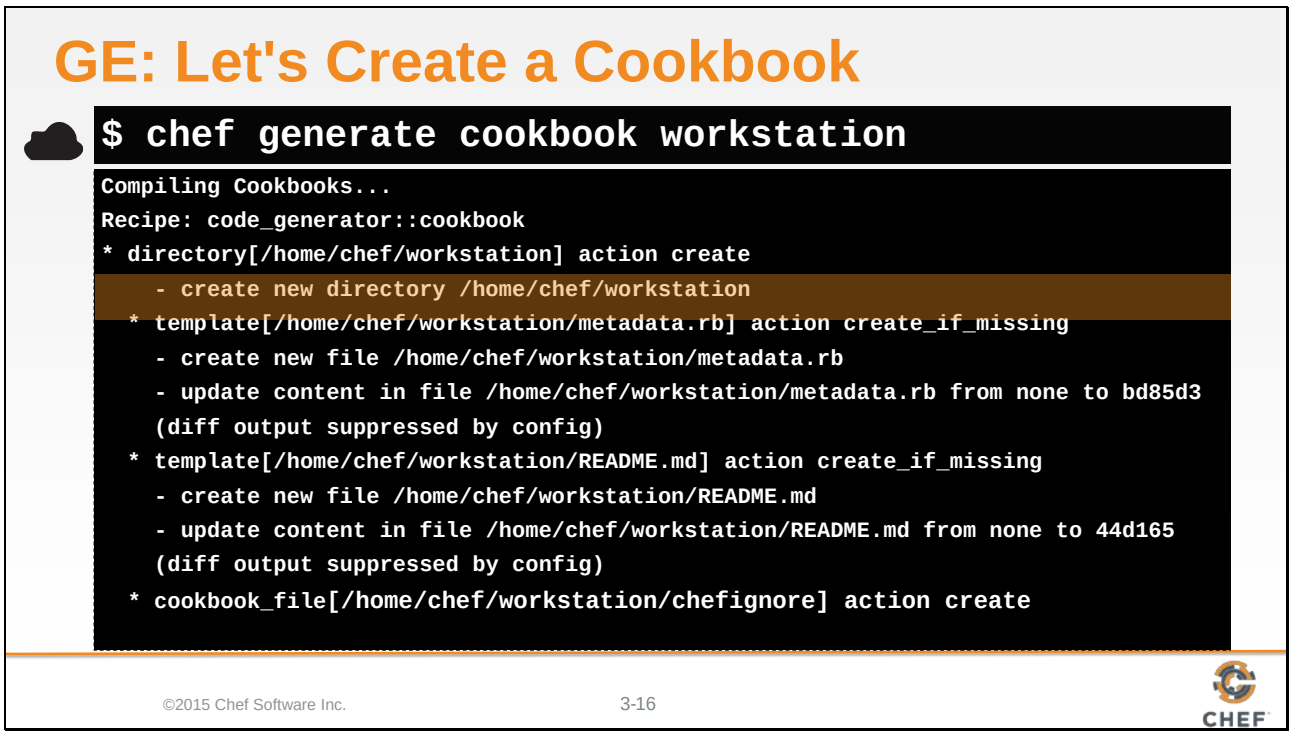


Lets ask the 'chef generate cookbook' command for help to see how it is used.

To generate a cookbook, all we have to do is provide it with a name.

There are two hard things in Computer Science and one of those is giving something a name.

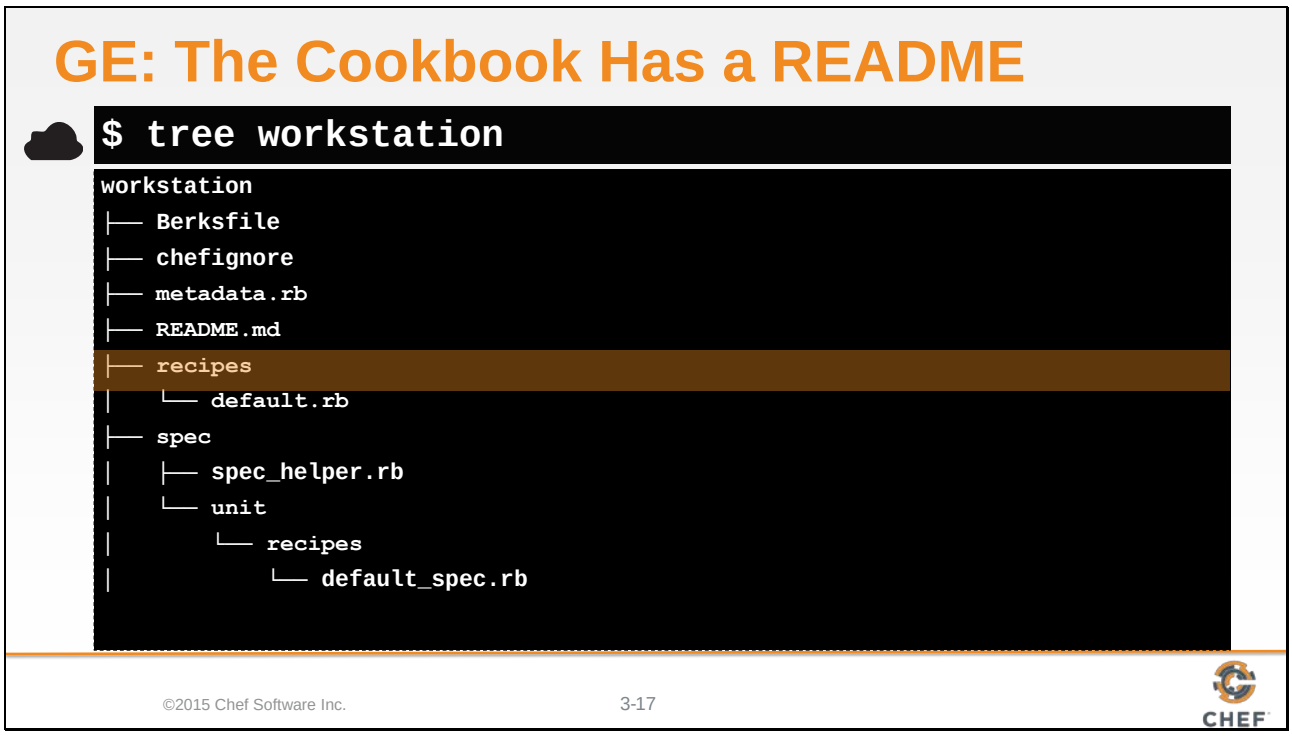
Slide 16



We have you covered. Call the cookbook *workstation*. That's a generic enough name.

We want you to use '`chef generate`' to generate a cookbook named *workstation*.

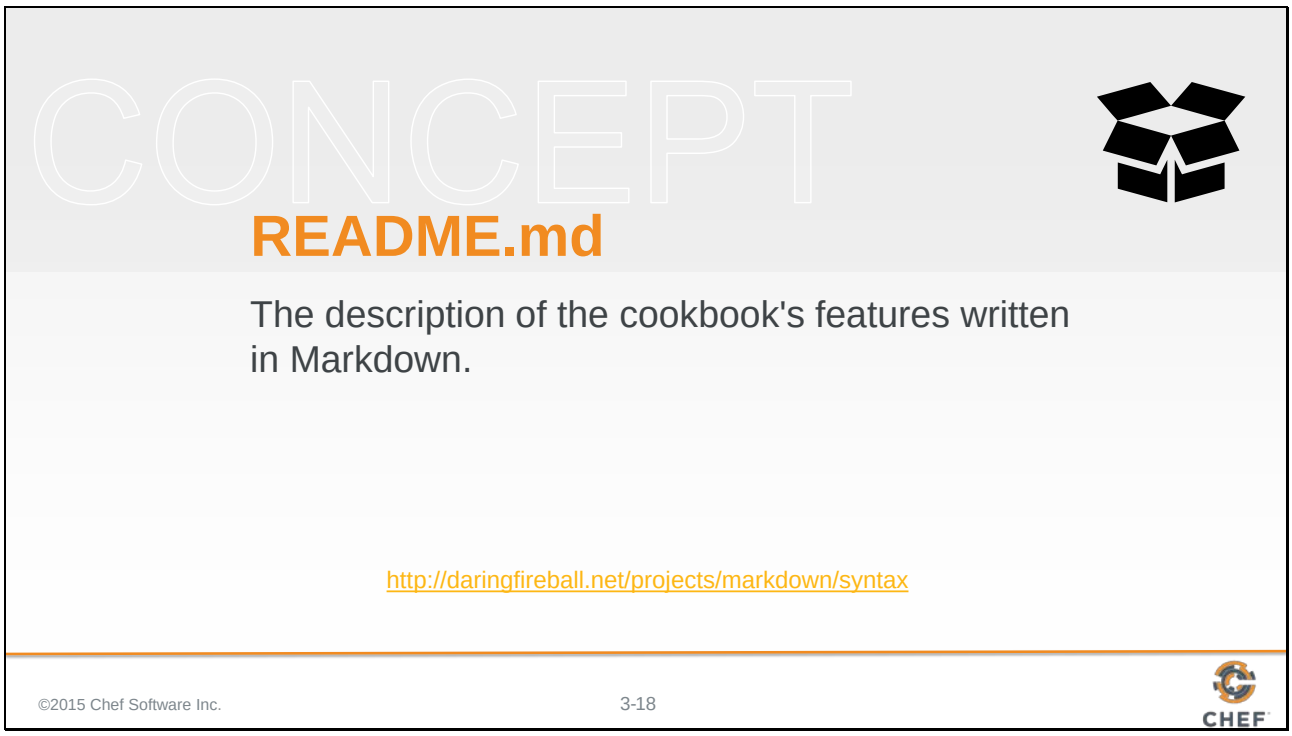
Slide 17



Aren't you curious what's inside it? Lets take a look with the help of the '**`tree`**' command. If we provide '**`tree`**' with a path we will see all the visible files in the specified directory.

So the chef cookbook generator created an outline of a cookbook with a number of default files and folders. The first one we'll focus on is the README.

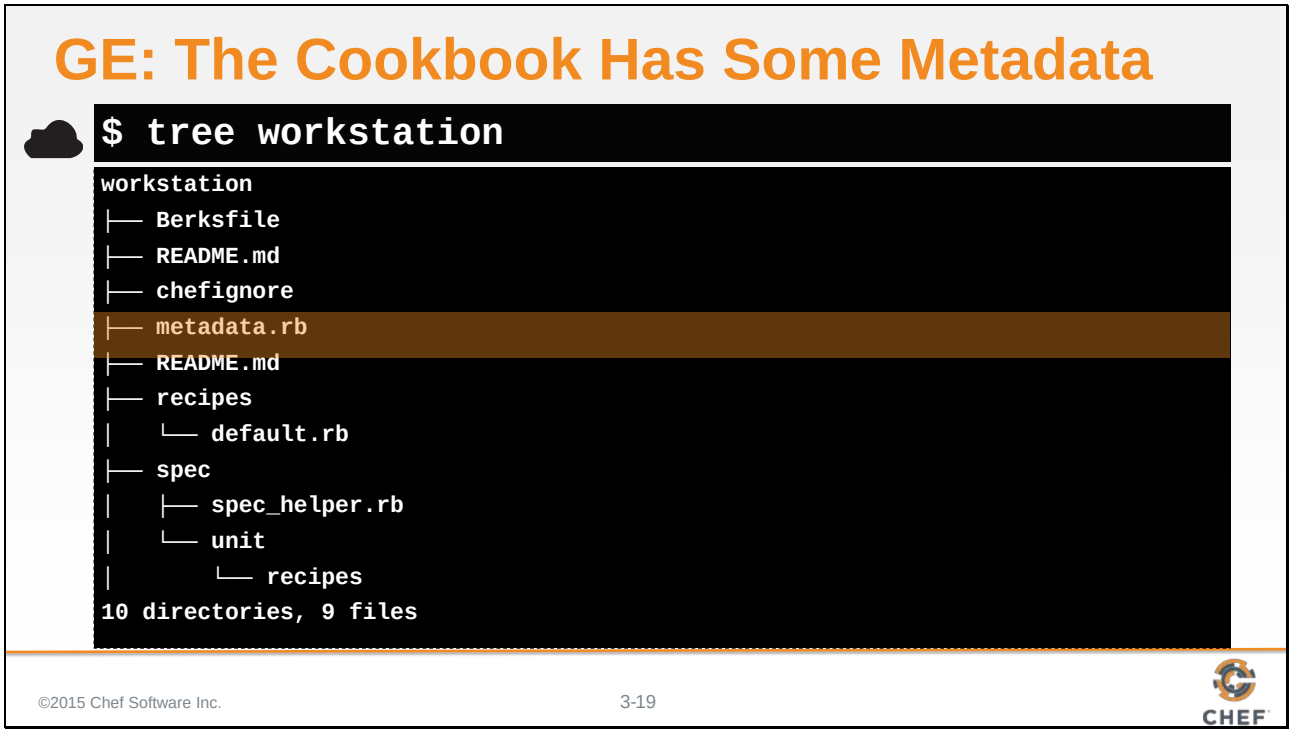
Slide 18



All cookbooks that 'chef' will generate for you will include a default README file. The extension `.md` means that the file is a markdown file.

Markdown files are text documents that use various punctuation characters to provide formatting. They are meant to be easily readable by humans and can be easily be rendered as HTML or other formats by computers.

Slide 19



The cookbook also has a metadata file.

Slide 20

DOCS

metadata.rb

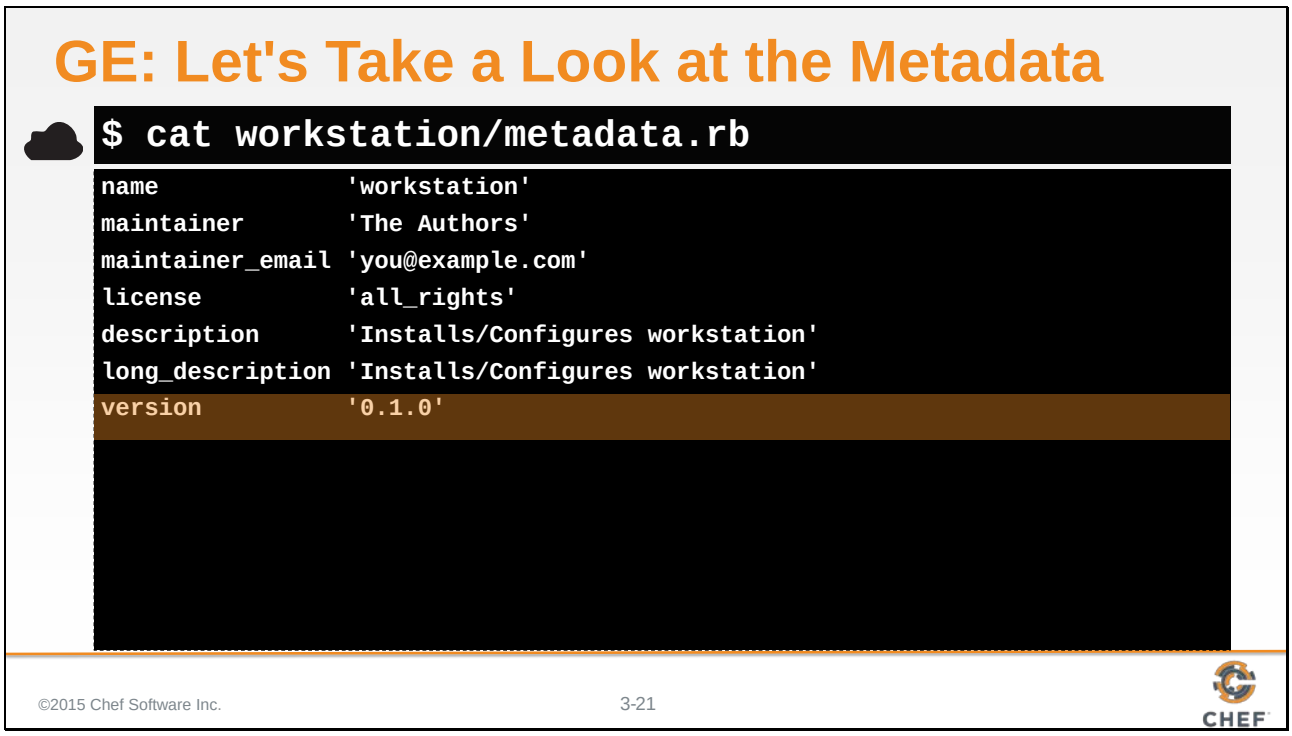
Every cookbook requires a small amount of metadata. Metadata is stored in a file called metadata.rb that lives at the top of each cookbook's directory.

http://docs.chef.io/config_rb_metadata.html

CHEF

This is a ruby file that contains its own domain specific language (DSL) for describing the details about the cookbook.

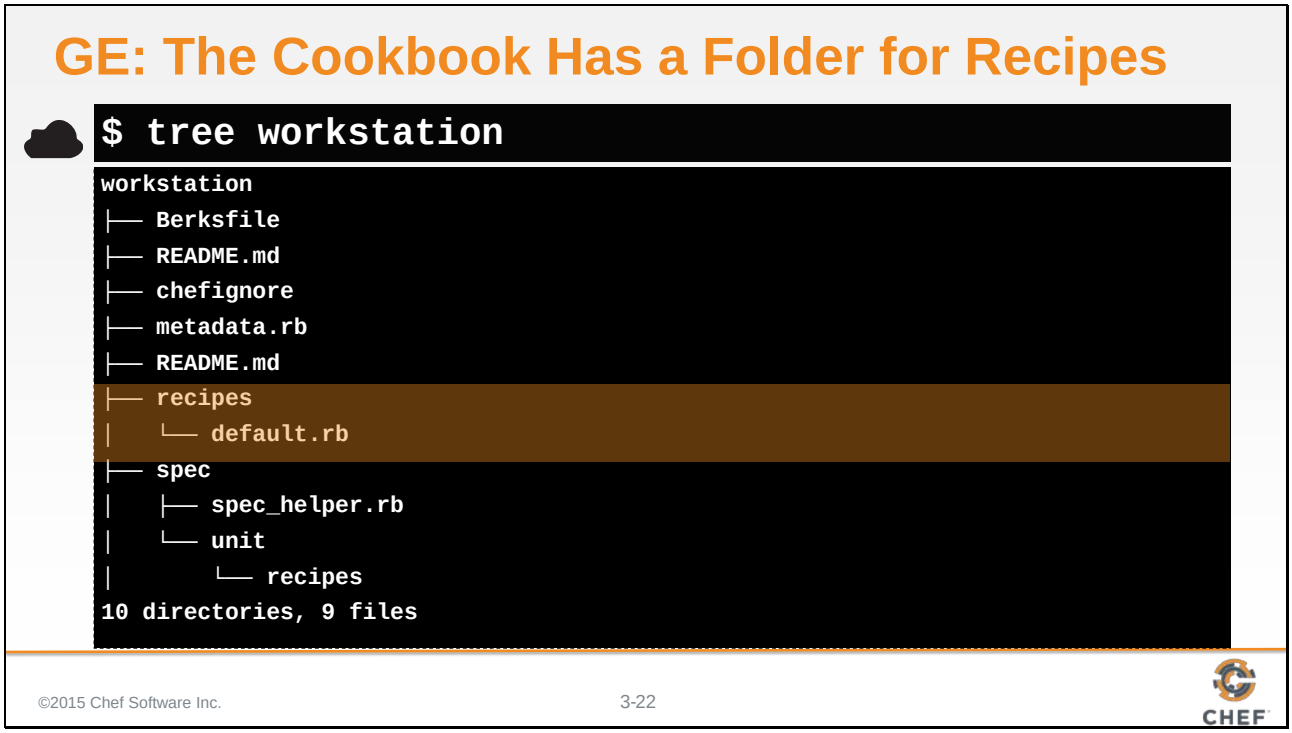
Slide 21



If you view the contents of your new cookbook's metadata, you'll see a number of details that help describe the cookbook:

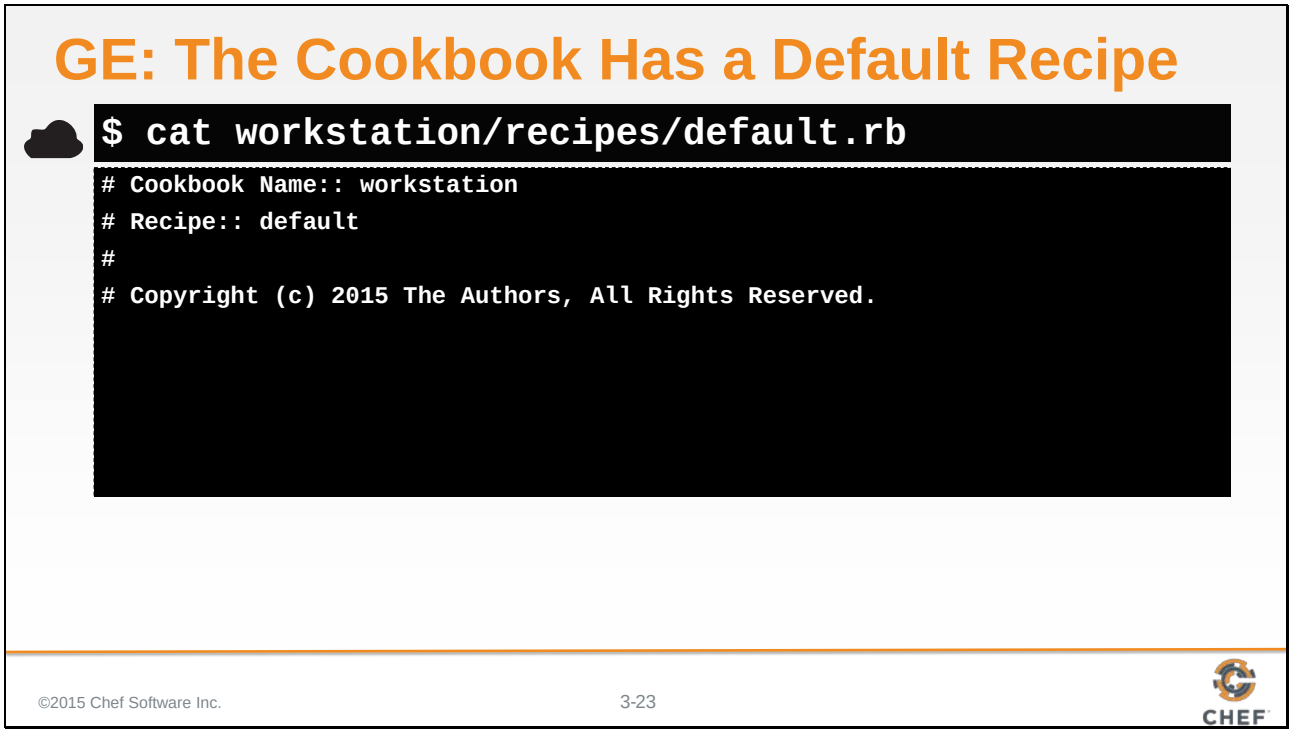
The name of the cookbook, its maintainer, a way to reach them, how the cookbook is licensed, descriptions, and the cookbook's version number.

Slide 22



The cookbook also has a folder named *recipes*. This is where we store the recipes in our cookbook. You'll see that the generator created a default recipe in our cookbook. What does it do?

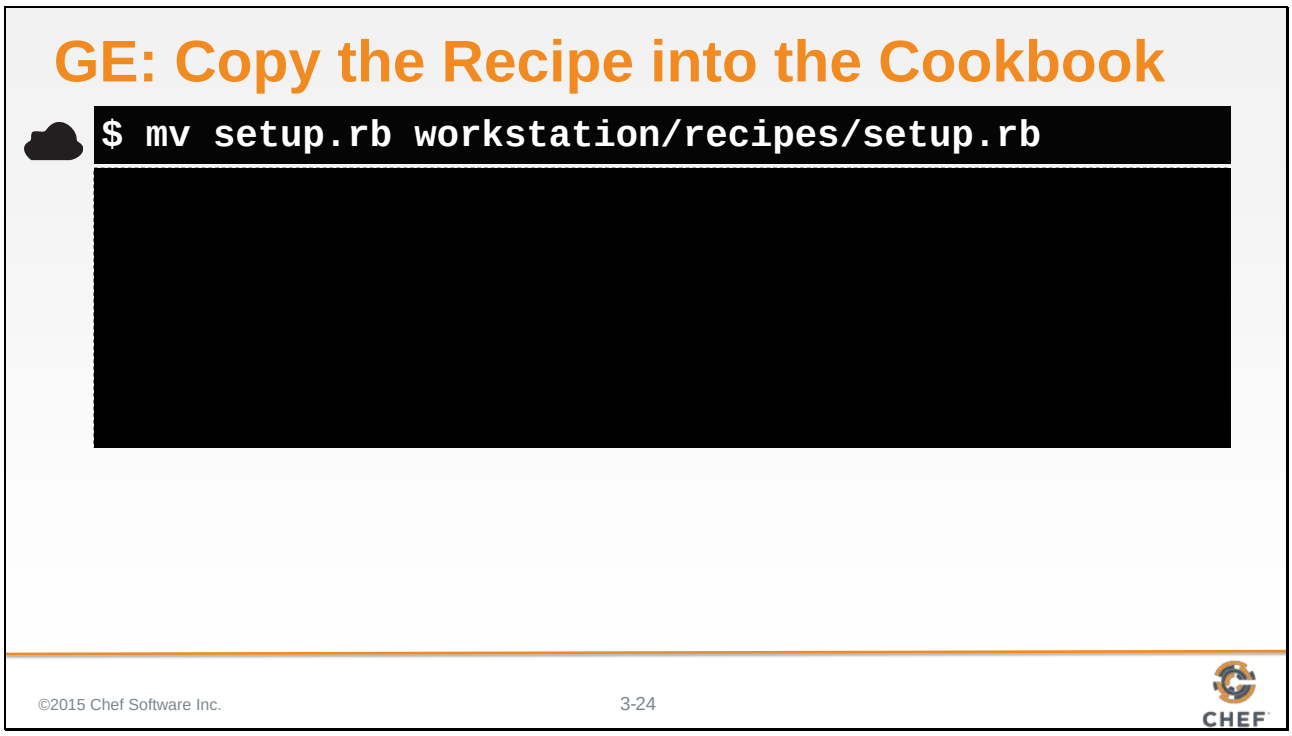
Slide 23



Looking at the contents of the default recipe you'll find it's empty except for some ruby comments.

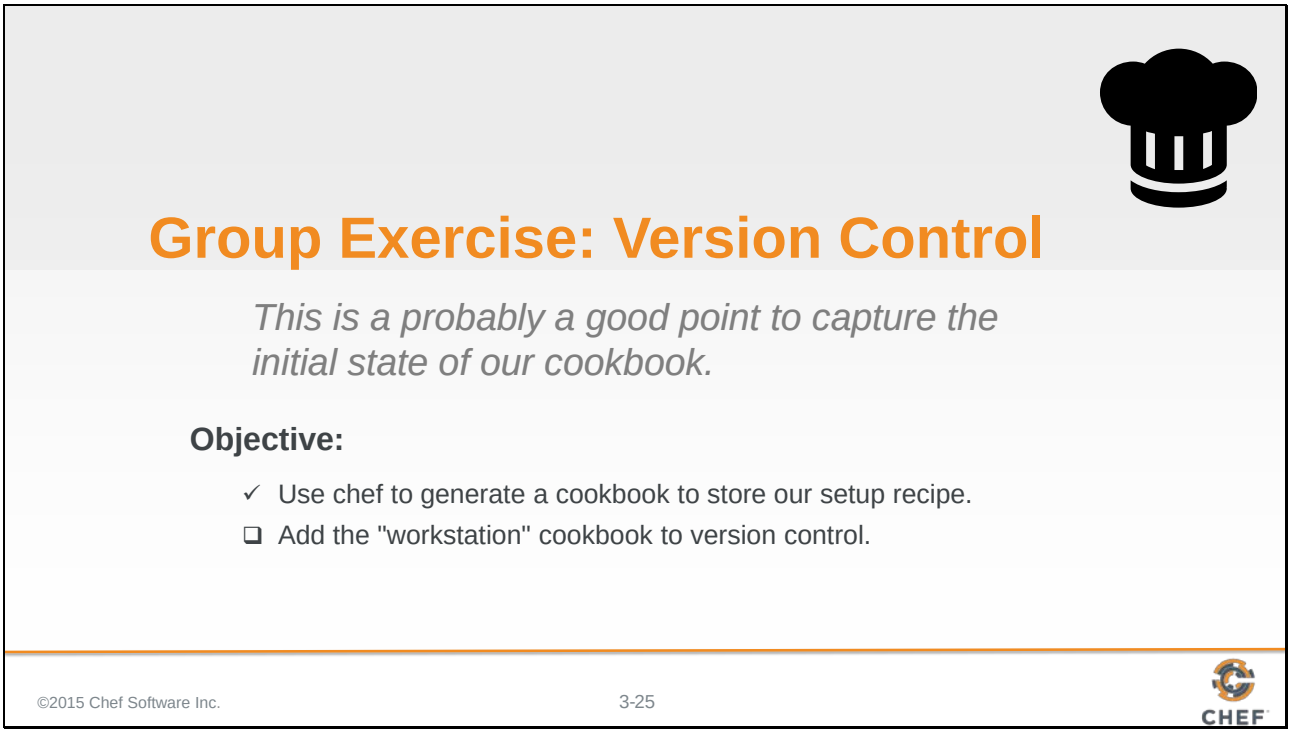
A cookbook doesn't have to have a default recipe but most every cookbook has one. It's called *default* because when you think of a cookbook, it is probably the recipe that defines the most common configuration policy.

Slide 24



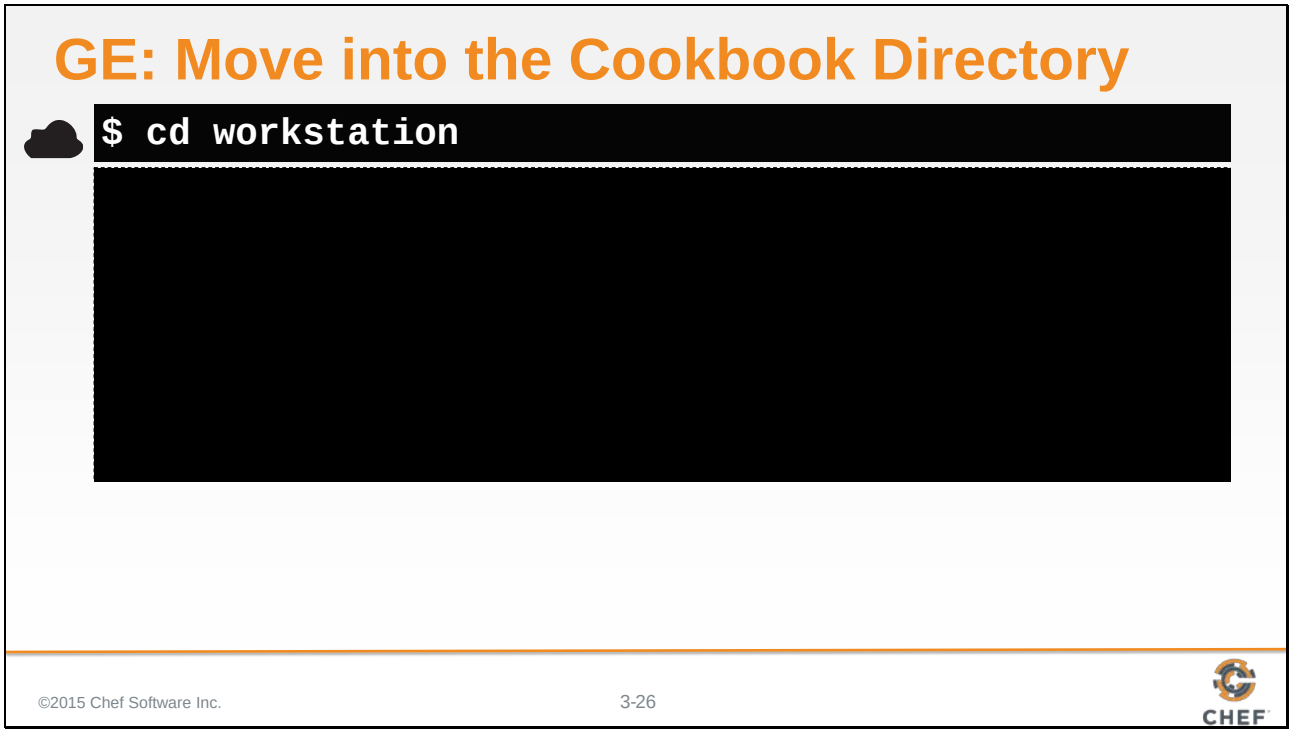
From the Home directory, move your setup.rb recipe to the workstation cookbook and place it alongside our default recipe.

Slide 25



Now that we have our cookbook with its README and version number, it's time to start tracking our changes with git.

Slide 26

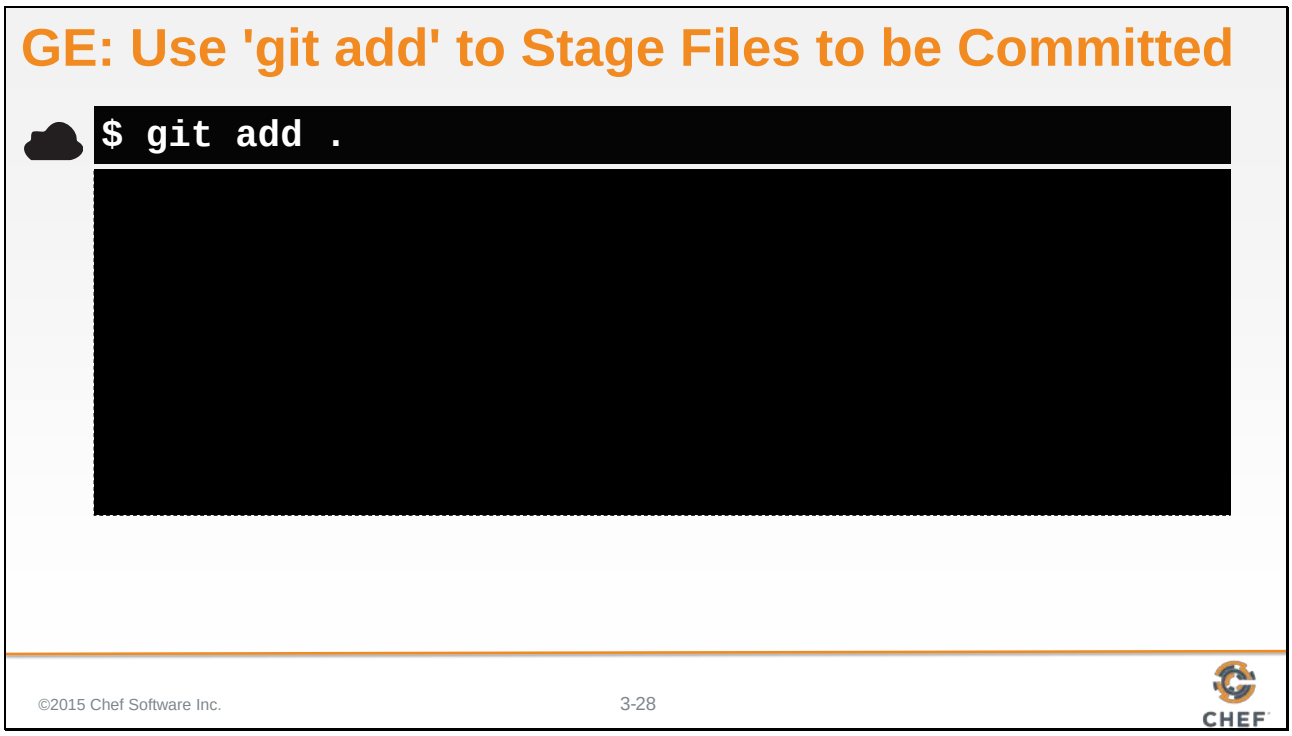


Change into the workstation cookbook directory.

Slide 27

We want git to start tracking the entire contents of this folder and any content in the subfolders. To do that with git, you need to execute the command 'git init' in the parent directory of the cookbook that you want to start tracking.

Slide 28



Now we need to tell git which files it should start tracking in source control. In our case, we want to add all the files to the repository and we can do that by executing `'git add .'` (dot).

This will place all the files into a staging area.

Slide 29

CONCEPT

Staging Area

The staging area has a file, generally contained in your Git directory, that stores information about what will go into your next commit.

It’s sometimes referred to as the “index”, but it’s also common to refer to it as the staging area.

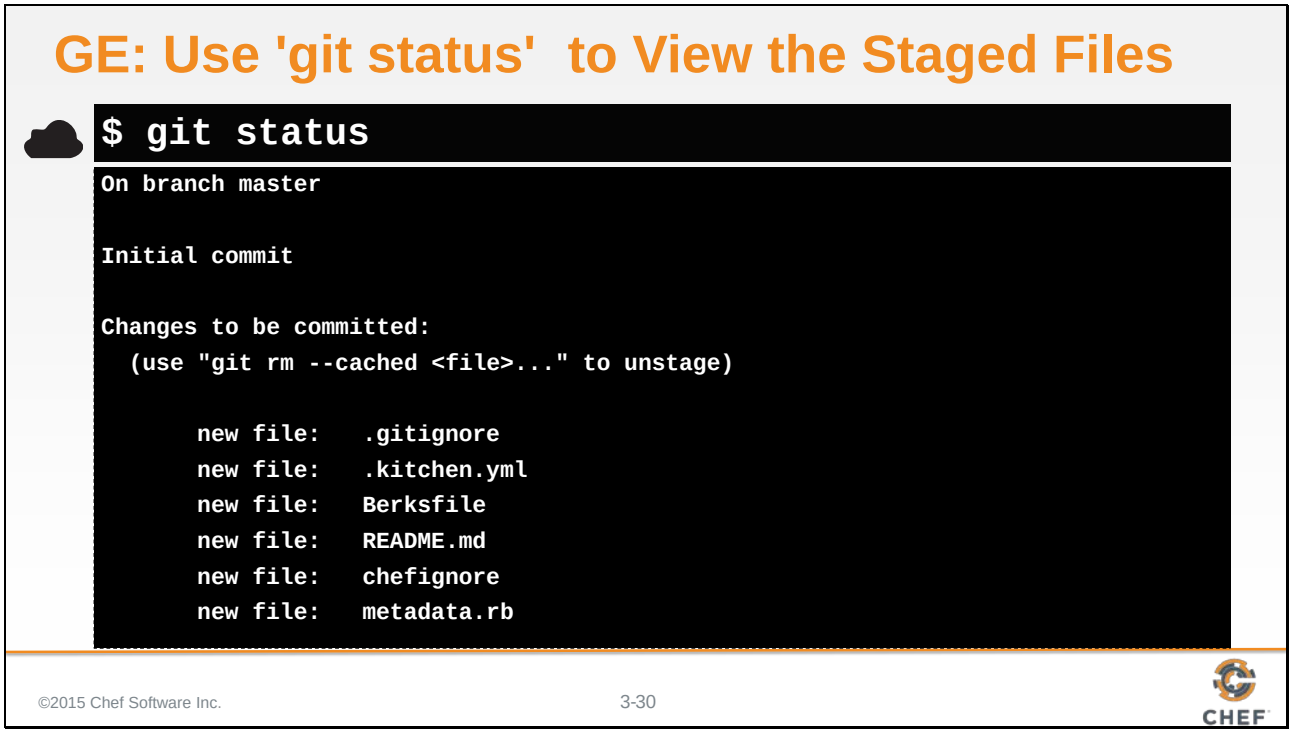
http://git-scm.com/book/en/v2/Getting-Started-Git-Basics

CHEF

You can think of the staging area as a box in which to put a bunch of items -- like a care package you would send to someone.

Staging files means to put them in the box, but don't close it up because you may add a few things, and don't close it up because you may replace or remove a few things. But put the items in the box because eventually we are going to close that box when it is ready to send it off.

Slide 30



Lets see what changes we have placed in the staging area.

Thinking about our care package example, this is like looking inside the box and taking an inventory, allowing us to figure out if we need to move more things in or remove things we accidently threw in there.

Running `git status` allows us to see in the box. Git reports back to us the changes that will be committed.

.

Slide 31

GE: Use 'git commit' to Save the Staged Changes

```
$ git commit -m "Initial workstation cookbook"
master (root-commit) 9998472] Initial workstation cookbook
 Committer: ChefDK User <chef@ip-172-31-59-191.ec2.internal>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author
```


If everything that is staged looks correct, then we are ready to commit the changes.

This is like saying we're ready to close the box up.

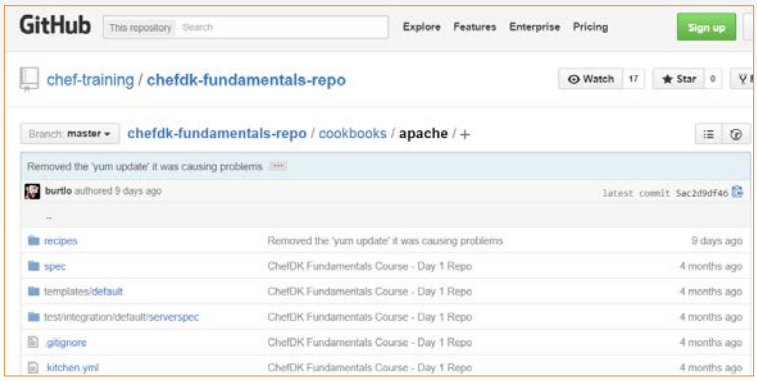
This is done in git with **git commit**. We can optionally provide a message on the command-line and that is done with the **-m** flag and then a string of text that describes that change.

Slide 32

Git Version Control

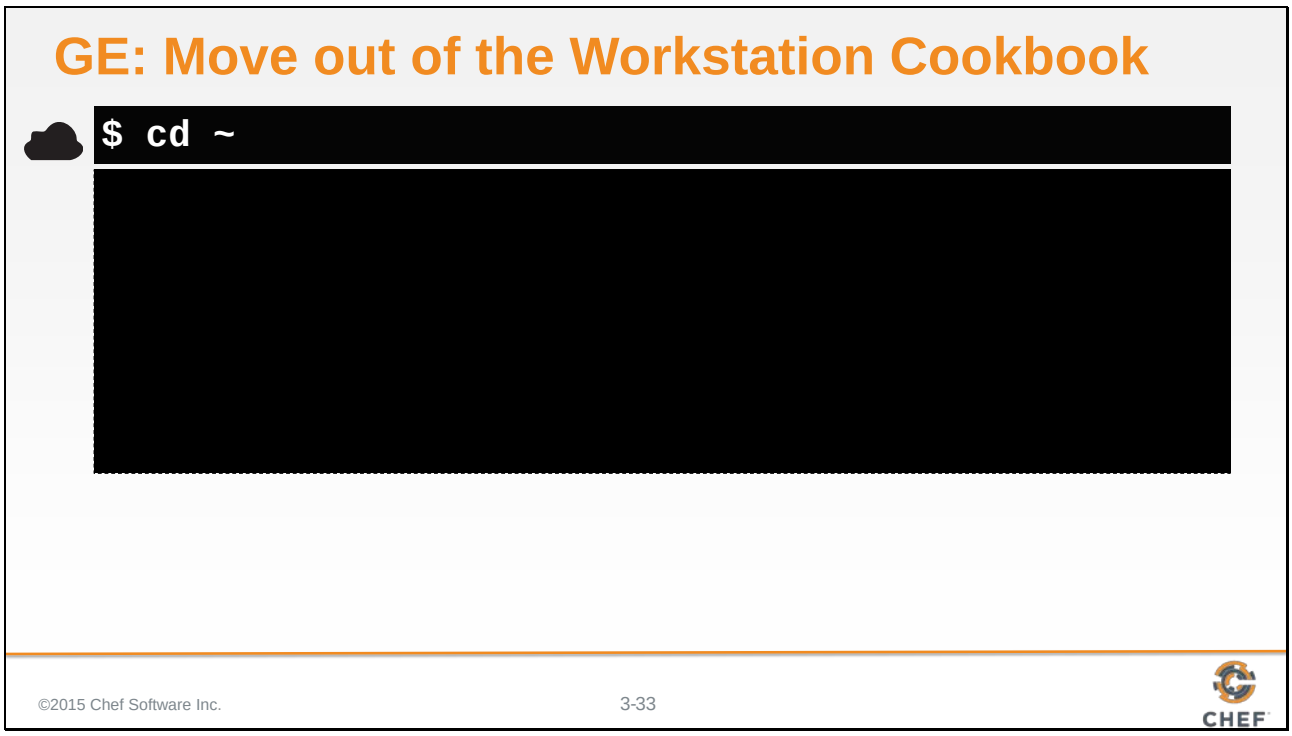
If you use git versioning you should ultimately push the local git repository to a shared remote git repository.

In this way others could collaborate with you from a centralized location.



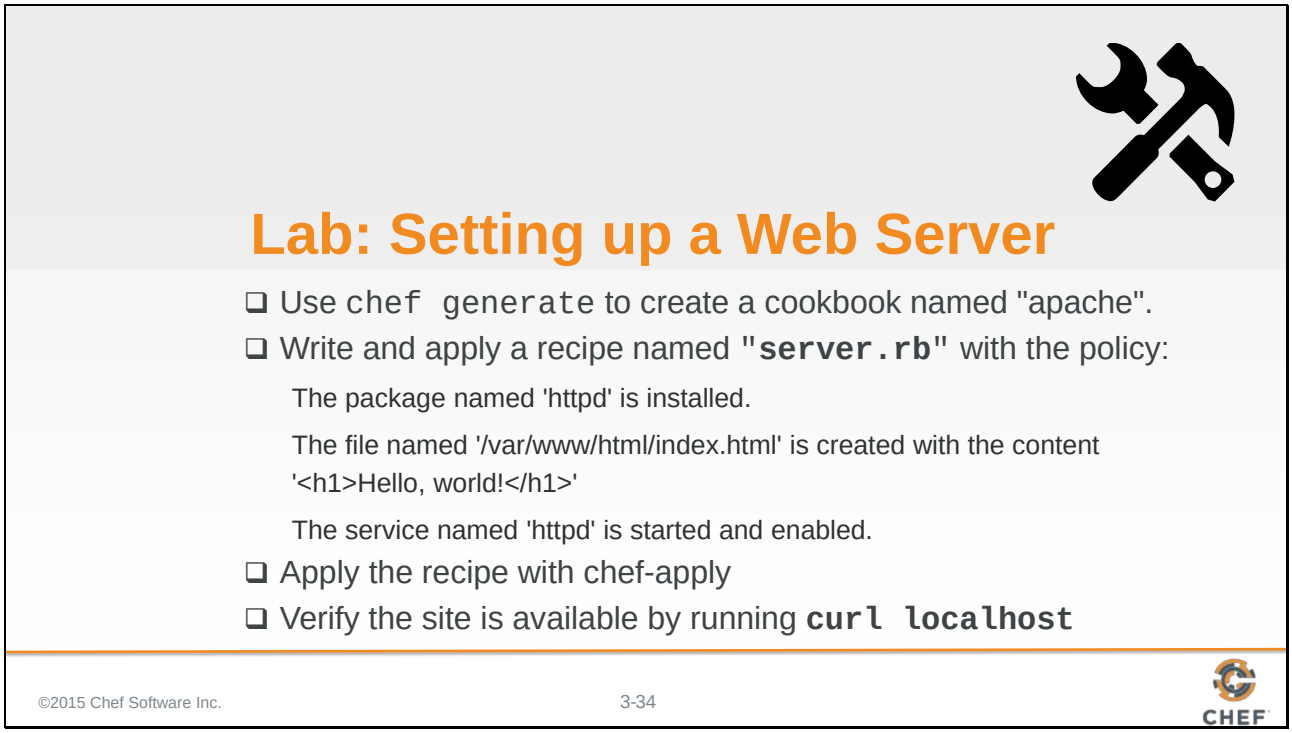
git tracks all our commits, all those closed up boxes, locally on the current system. If we wanted to share those commits with other individuals we would need to push those changes to a central repository where we could collaborate with other members of the team.

Slide 33



Now that we are done adding our workstation cookbook to version control lets return to our home directory.

Slide 34



Now. Here is your latest challenge. Deploying a Web Server with Chef.

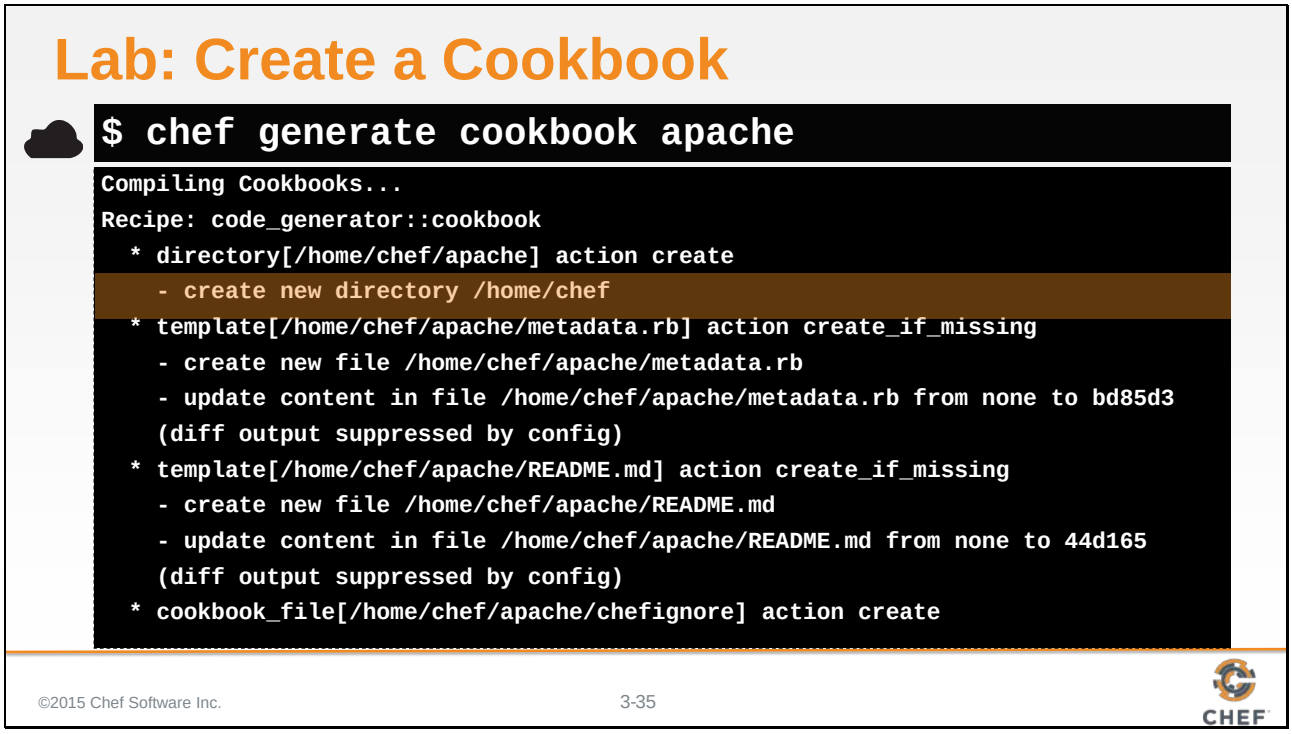
Thinking about all that we have accomplished so far that hopefully seems possible.

We need a cookbook named apache that has a server recipe. Within that server recipe we need to install the appropriate package. Write out an example HTML file, and then start and enable the service.

Then we should apply that recipe and make sure the site is up and running by running a command to visit that site.

So show me it can be done!

Slide 35



From the Chef home directory, run the command 'chef generate cookbook apache'. This will place the apache cookbook alongside the workstation cookbook.

Slide 36

Lab: Create Apache Recipe

~/apache/recipes/server.rb

```
package 'httpd'

file '/var/www/html/index.html' do
  content '<h1>Hello, world!</h1>'
end

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

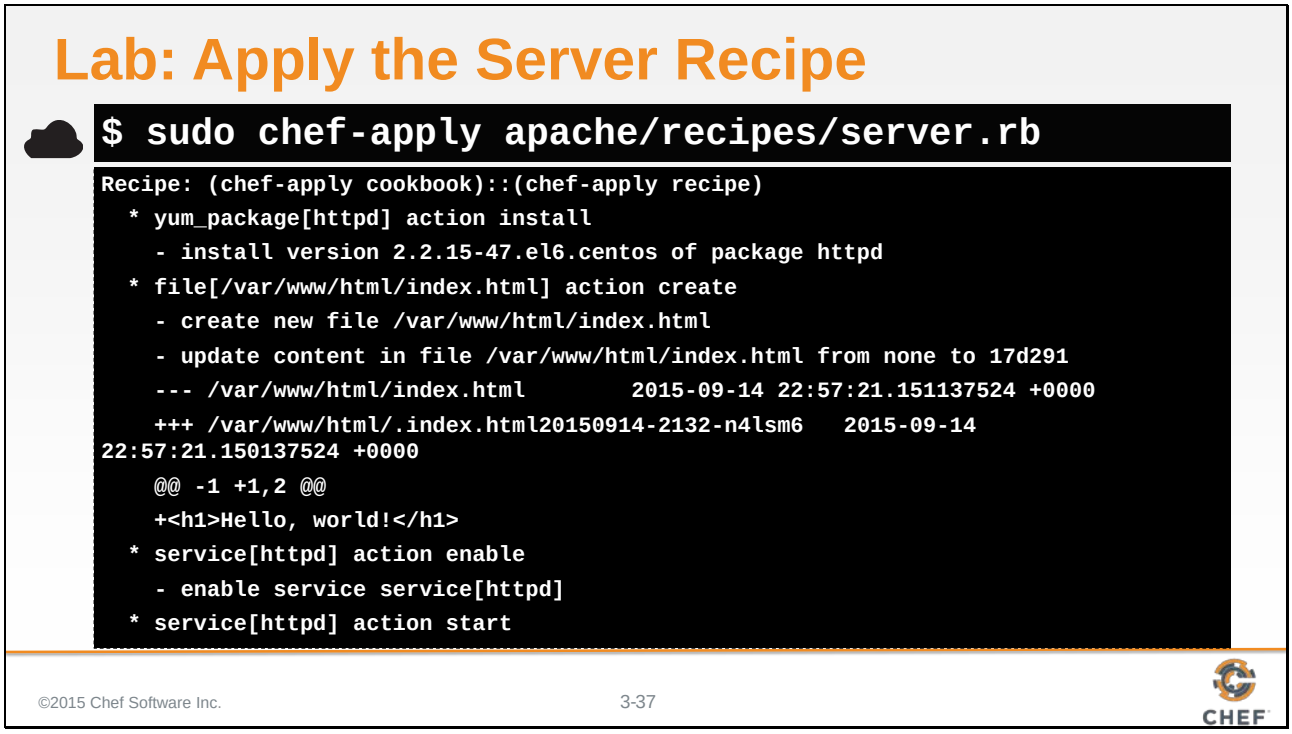

The server recipe, found at ~/apache/recipes/server.rb, defines the policy:

* The package named **httpd** is installed.

* The file named '/var/www/html/index.html' is created with the content 'Hello, world!'

- The service named **httpd** is started and enabled.

Slide 37

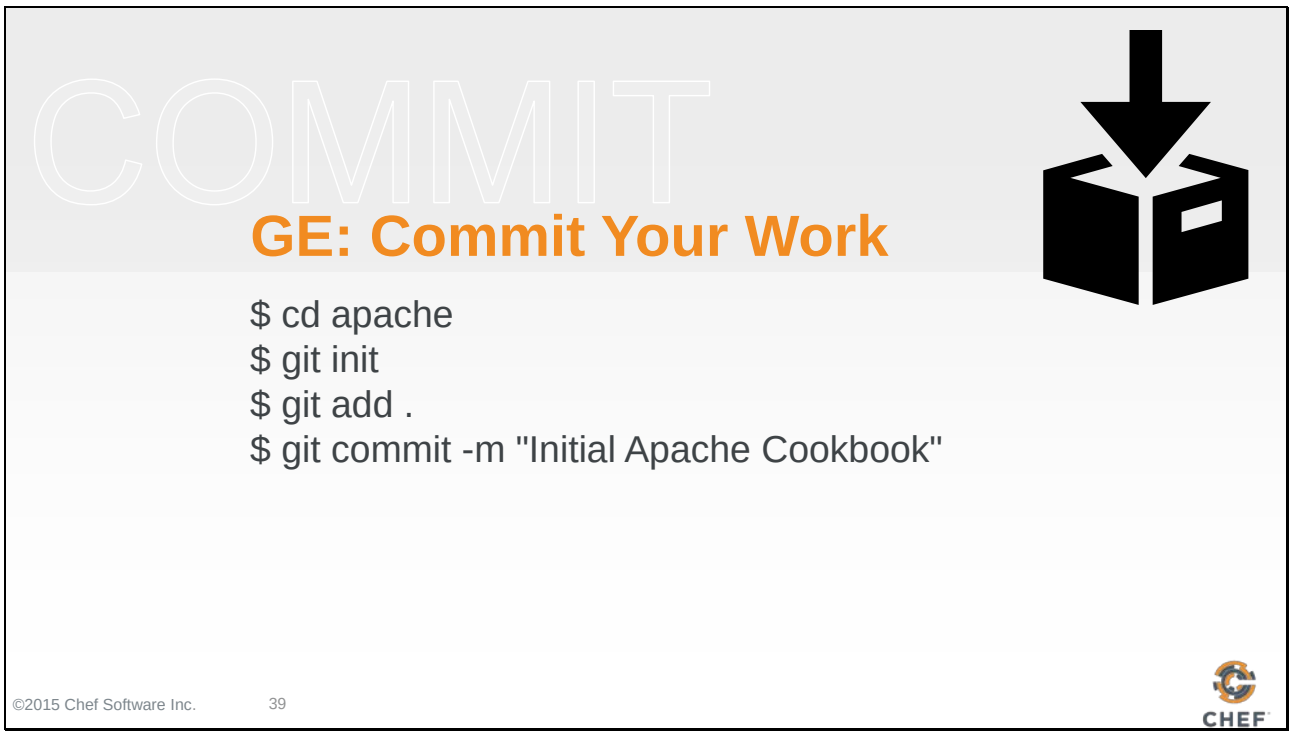


When applying the recipe with '**chef-apply'**, you need to specify the partial path to the recipe file within the apache cookbook's recipe folder.

Slide 38

You already setup apache, which is a web server. So verify that the website is available and returns the content we expect to see.

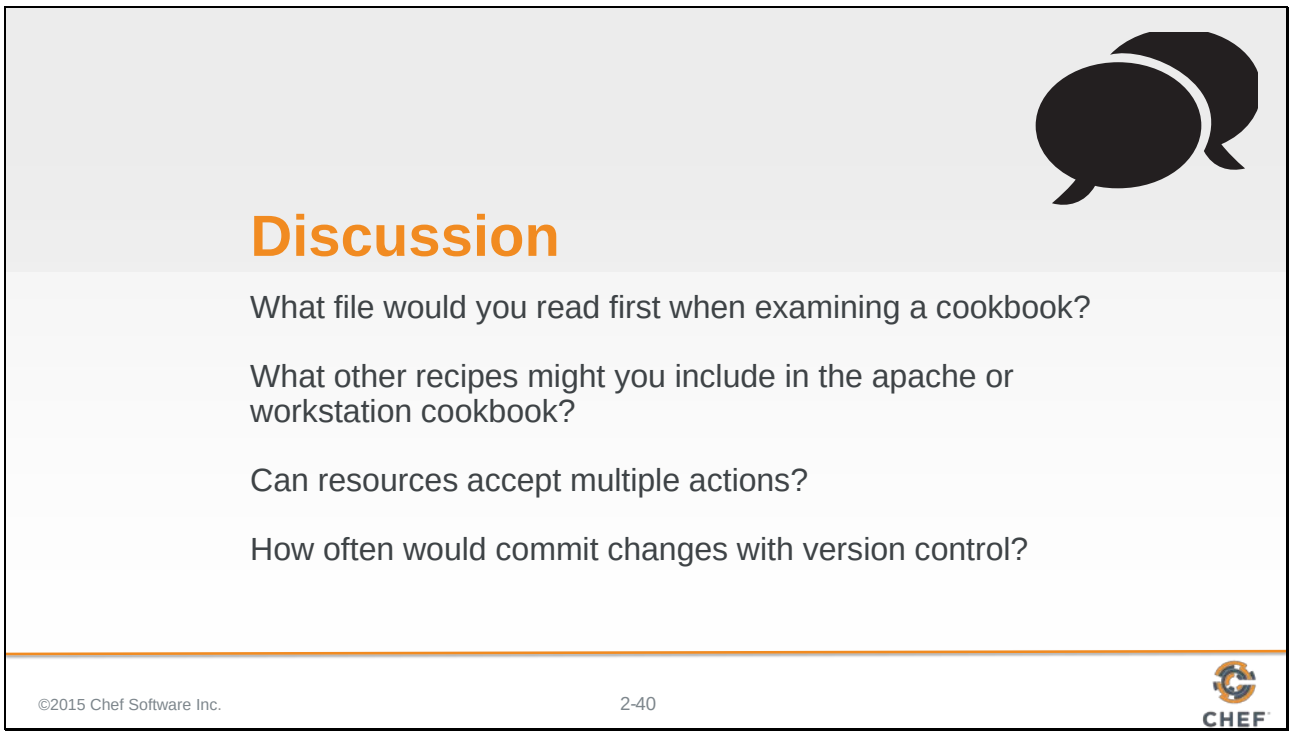
Slide 39



Now, with everything working it is time to add the apache cookbook to version control.

- Move into the apache directory.
- Initialize the cookbook as a git repository.
- Add all the files within the cookbook.
- And commit all the files in the staging area.

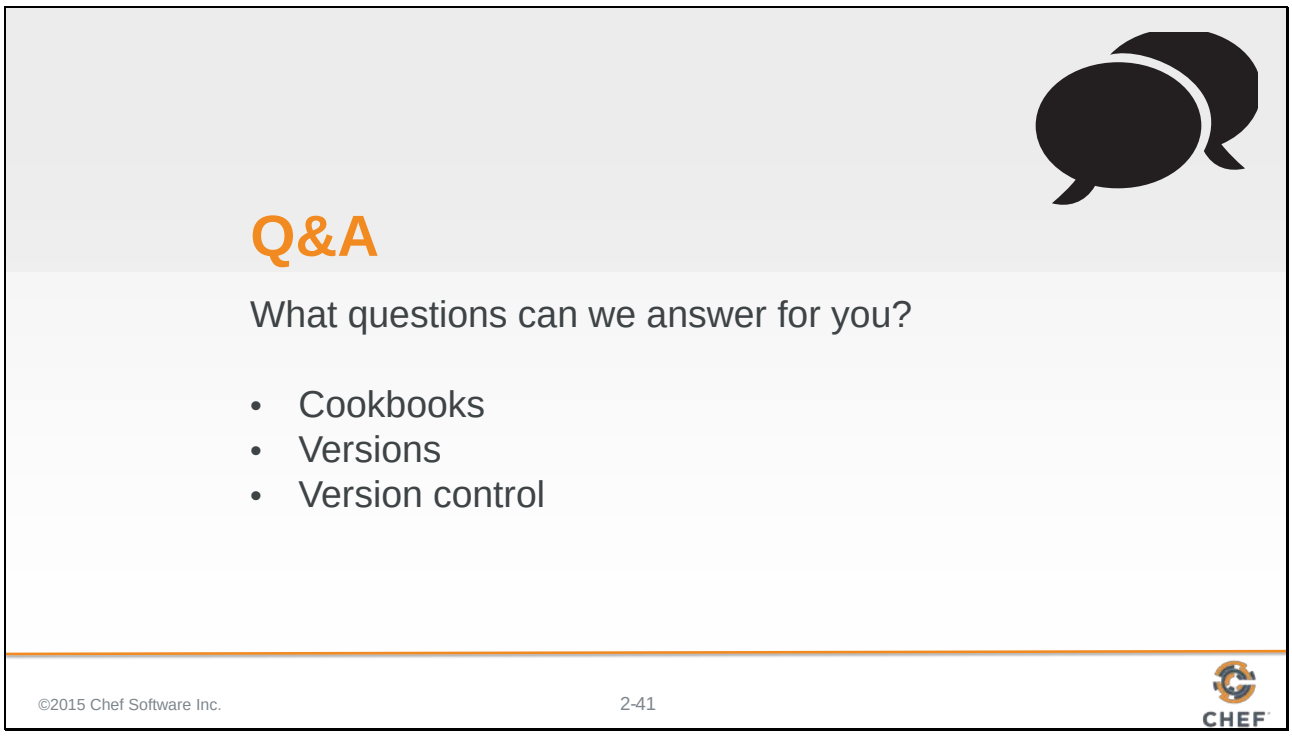
Slide 40



Answer these questions.

With your answers, turn to another person and alternate asking each other asking these questions and sharing your answers.

Slide 41



What questions can we help you answer?

General questions or more specifically about cookbooks, versioning and version control.

Slide 42