

Intro to Chef

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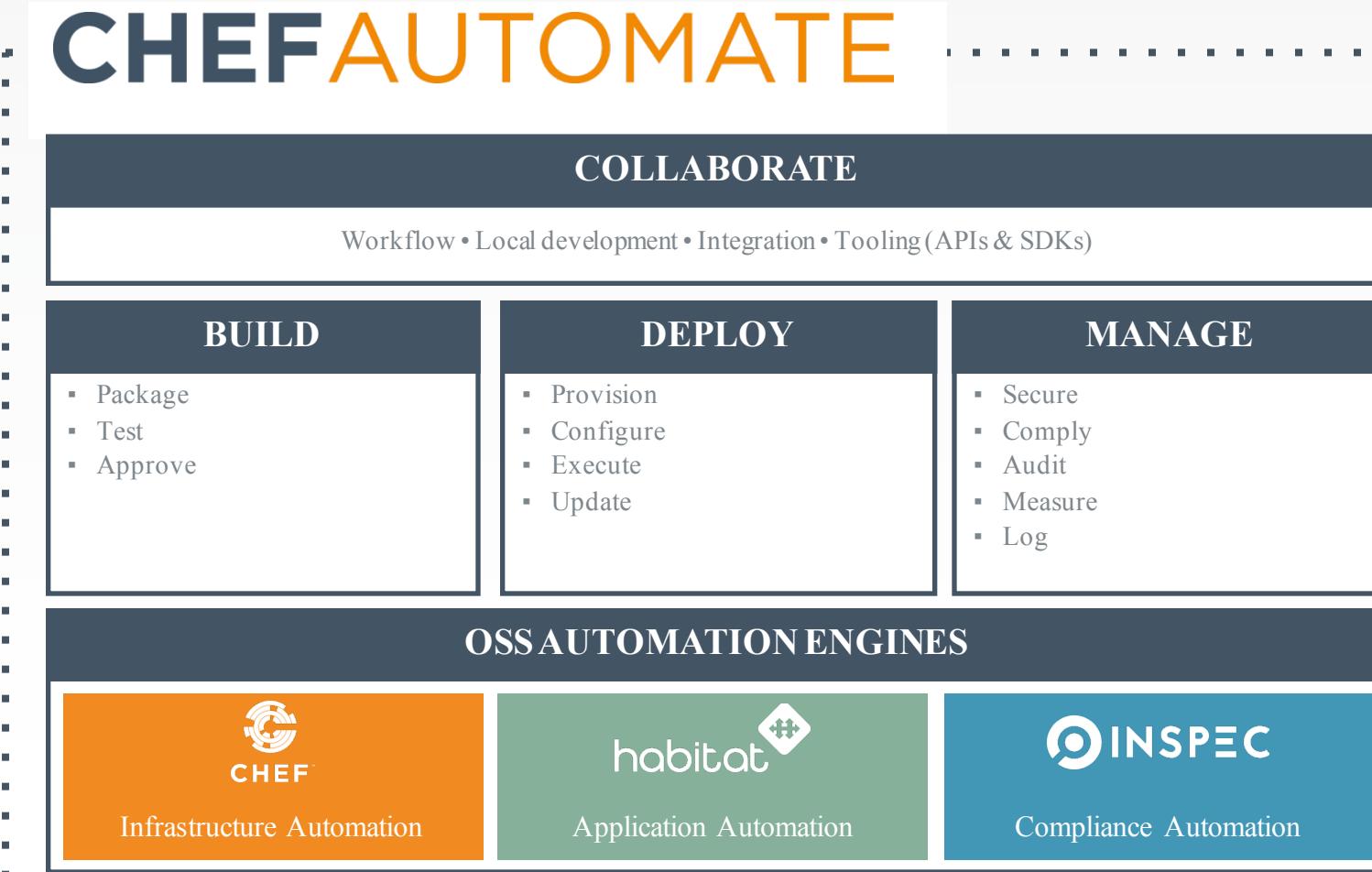
@ubergeekgirl jessica@chef.io



CHEF™

The Chef Automate Platform

Continuous Automation for High Velocity IT



Increase Speed

- Package infrastructure and app configuration as code
- Continuously automate infrastructure and app updates

Improve Efficiency

- Define and execute standard workflows and automation
- Audit and measure effectiveness of automation

Decrease Risk

- Define compliance rules as code
- Deliver continuous compliance as part of standard workflow



Chef

Infrastructure automation and delivery at scale

- Manages **deployment** and on-going automation
- Define **reusable** resources and infrastructure state as code
- Scale elegantly from one to tens of thousands of **managed** nodes across multiple complex environments
- Community, Certified Partner, and Chef supported content available for **all common automation** tasks

```
windows_feature 'IIS-WebServerRole' do
  action :install
end

windows_feature 'IIS-ASPNET' do
  action :install
end

iis_pool FooBarPool do
  runtime_version "4.0"
  action :add
end

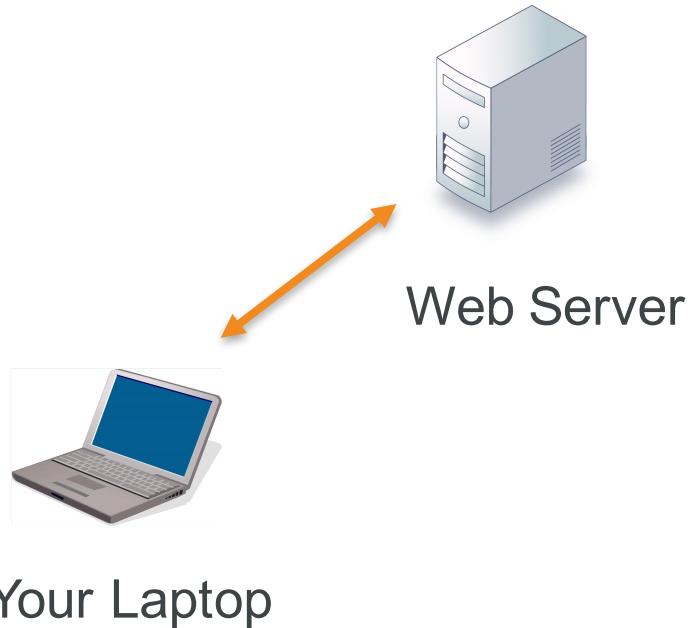
package "apache" do
  action :install
end

template "/etc/httpd/https.conf" do
  source "httpd.conf.erb"
  mode 0075
  owner "root"
  group "root"
end

service "apache2" do
  action :start
done
```

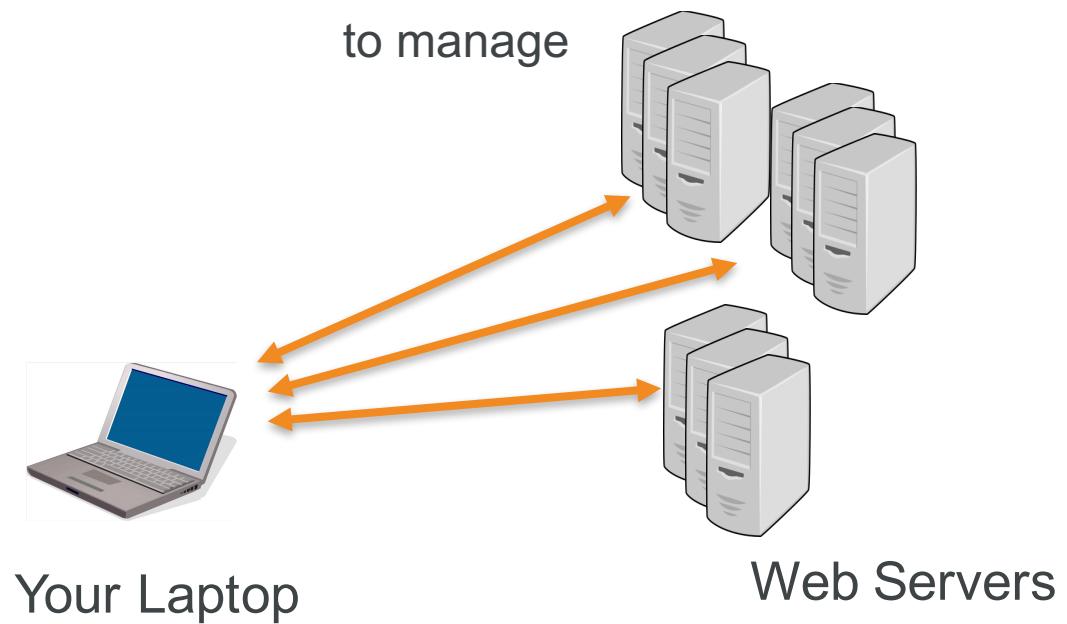
Managing Additional Systems

Now



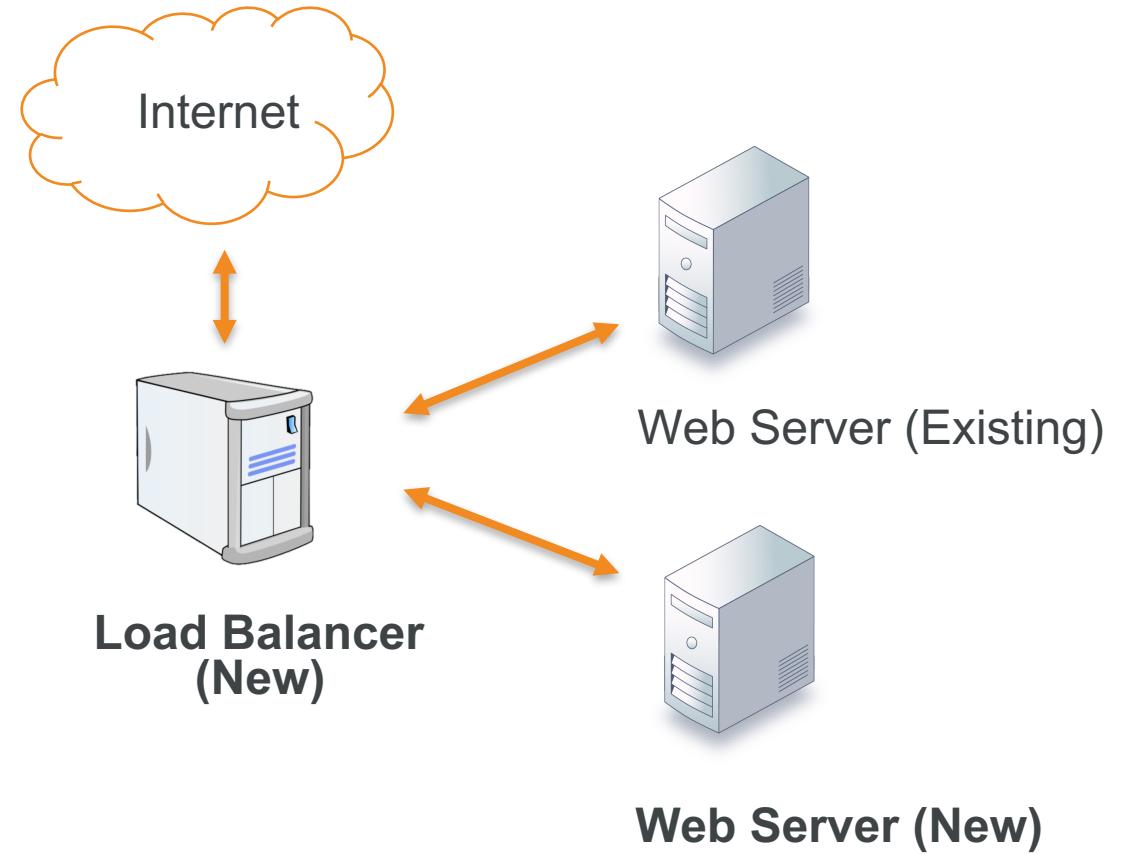
Future

More complex
to manage



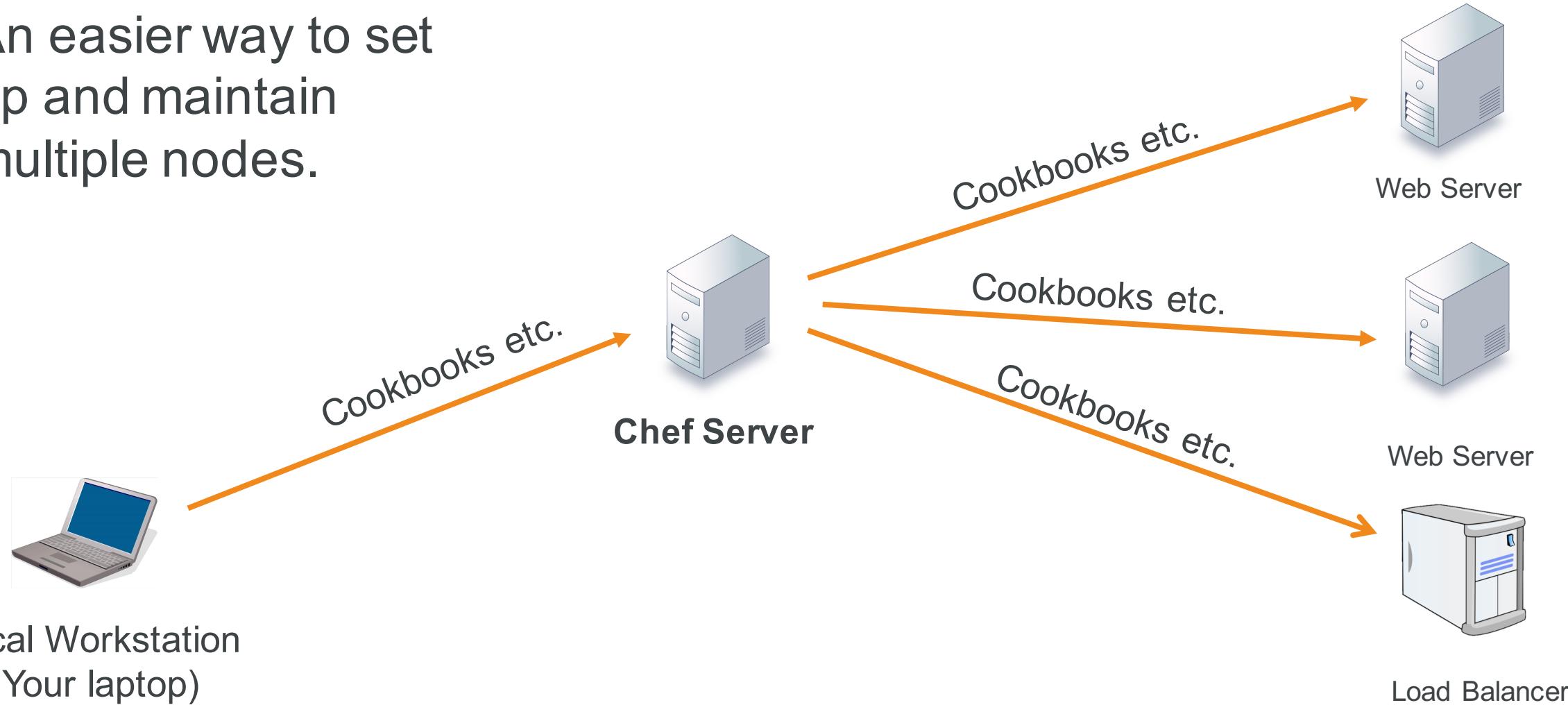
Managing User Traffic

Today you will set up a new load balancer that will direct web requests to similarly-configured nodes.



The Chef Server

An easier way to set up and maintain multiple nodes.

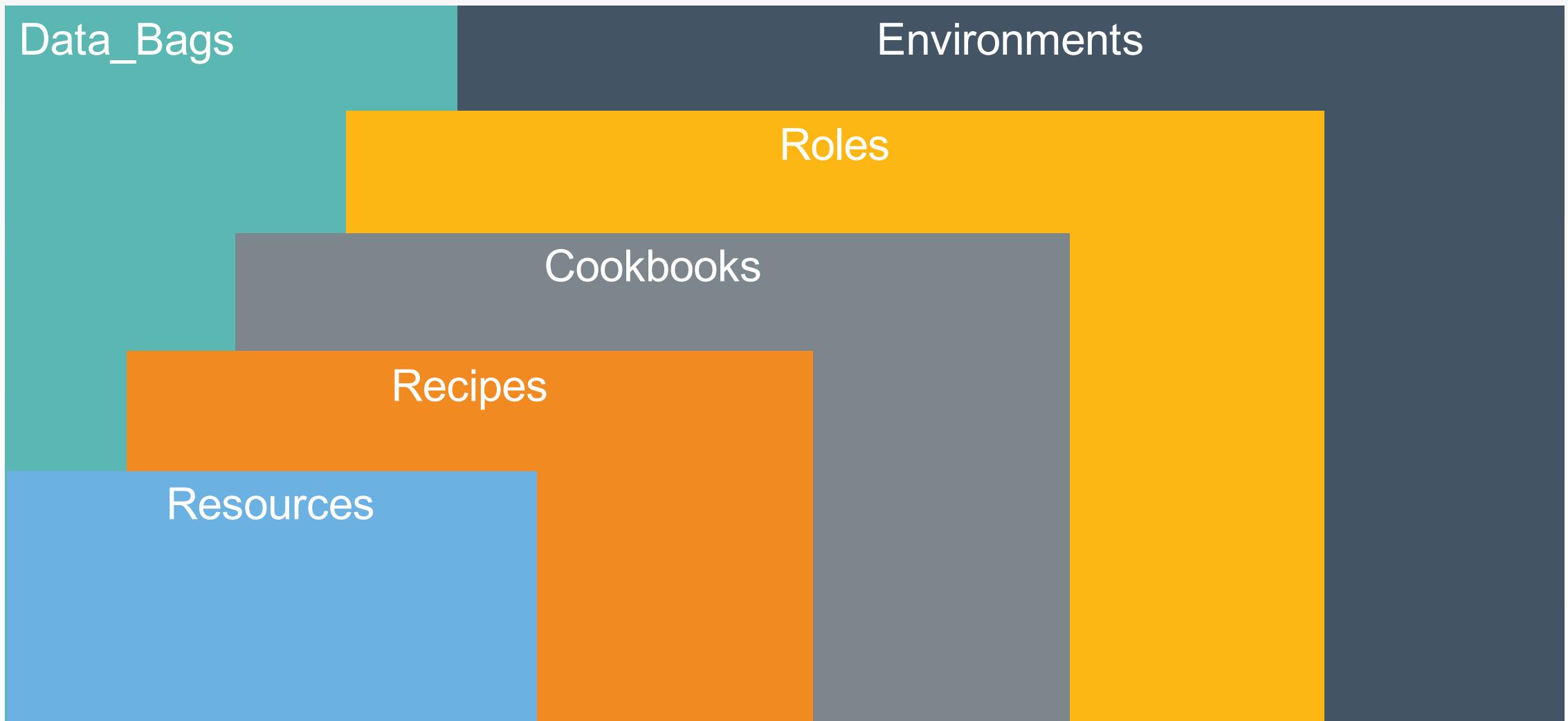


Learning Chef

One of the best ways to learn a technology is to apply the technology in every situation that it can be applied.

A number of chef tools are installed on the system so lets put them to use.

Building Blocks



CHEF™

Building Blocks: What is a Resource?

- A Resource is a system state you define

Example: Package installed, state of a service, configuration file existing

- You declare what the state of the resource is

Chef automatically determine HOW that state is achieved

```
windows_feature "IIS-WebServerRole" do
  action :install
end
```

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

Building Blocks: What is a Recipe?

- A recipe is a collection of Resources
- Resources are executed in the order they are listed

```
windows_feature "IIS-WebServerRole" do
  action :install
end

template 'c:\inetpub\wwwroot\Default.htm' do
  source "Default.htm.erb"
  rights :read, "Everyone"
end

service "w3svc" do
  action [ :enable, :start ]
end
```

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

template "/var/www/index.html" do
  source "index.html.erb"
  mode "0644"
end

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

Building Blocks: What is a Cookbook?

- A cookbook is a set of recipes
- A cookbook is a defined set of items and different outcomes that you expect to address

A cookbook could have a recipe to install apache2/httpd but also another set of recipes to activate modules required.

```
./attributes  
./attributes/default.rb  
./CHANGELOG.md  
./metadata.rb  
./README.md  
./recipes  
./recipes/application.rb  
./recipes/balancer.rb  
./recipes/database.rb  
./recipes/default.rb  
./recipes/webserver.rb  
./templates  
./templates/default  
./templates/default/mysite.conf.erb
```

Building Blocks: What is a role?

- Define reusable roles for Infrastructure Code

```
chef_type:                  role
default_attributes:
  my-app:
    application:
      version:        1.5.6
description:                 Role for my application
json_class:                  Chef::Role
name:                        my_application_role
run_list:
  role[base]
  recipe[my-app::application]
```

Building Blocks: What is an Environment?

- Define reusable environments for Infrastructure Code

```
chef_type:                      environment
cookbook_versions:
  database: 2.2.0
default_attributes:
  myapp:
    application:
      version: 1.2.3
description:                     Our production environment
json_class:                      Chef::Environment
name:                            production
```

Building Blocks: What is a Data_Bag?

- Define global variables accessible to all the things

```
deploy_key:  
  cipher:          aes-256-cbc  
  encrypted_data:  
    1IpW3sqd69wXt7+MB+uGXr0GfcrEf6rOnHLMA7H00ZCbTxMcEypguGD22w23  
    qzEZSzCf2ahv67CtcfrDGvUoWS57Gp5/QoR4WBVKQQUp1Y0LPtXMZFDISCLU  
    a0aNhrzrXhT9eDKNpru7hpuEkOZPRNstx1121bdMZ91m1/6BPBeIWUYrxAeS  
    . . . . .  
  iv:            tpz6zFz9xkscoi36kRw4JQ==  
  version:        1  
id:      jenkins_ssh_key
```

Building Blocks: What is a Resource?

- A Resource is a system state you define

Example: Package installed, state of a service, configuration file existing

- You declare what the state of the resource is

Chef automatically determine HOW that state is achieved

```
windows_feature "IIS-WebServerRole" do
  action :install
end
```

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

Example: Package

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

The package named 'httpd' is installed.

https://docs.chef.io/resource_package.html

Example: Service

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

The service named 'ntp' is enabled (start on reboot) and started.

https://docs.chef.io/resource_service.html

Example: File

```
file '/etc/motd' do
  content 'This computer is the property...'
end
```

The file name '/etc/motd' is created with content 'This computer is the property ...'

https://docs.chef.io/resource_file.html

Example: File

```
file '/etc/php.ini.default' do
  action :delete
end
```

The file name '/etc/php.ini.default' is deleted.

https://docs.chef.io/resource_file.html

Building Blocks: What is a Recipe?

- A recipe is a collection of Resources
- Resources are executed in the order they are listed

```
windows_feature "IIS-WebServerRole" do
  action :install
end

template 'c:\inetpub\wwwroot\Default.htm' do
  source "Default.htm.erb"
  rights :read, "Everyone"
end

service "w3svc" do
  action [ :enable, :start ]
end
```

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

template "/var/www/index.html" do
  source "index.html.erb"
  mode "0644"
end

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

GL: Use Your Editor to Open the Recipe



```
$ nano moo.rb
```

GL: Update the Moo Recipe

1 ~/.moo.rb

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

GL: Apply the Moo Recipe



```
$ sudo chef-client --local-mode moo.rb
```

```
Starting Chef Client, version 12.13.37
resolving cookbooks for run list: []
Synchronizing Cookbooks:
Installing Cookbook Gems:
Compiling Cookbooks...
[2016-08-22T20:20:45+00:00] WARN: Node ip-172-31-9-151.ec2.internal has an empty run list.
Converging 1 resources
Recipe: @recipe_files:::/home/chef/moo.rb
  * yum_package[cowsay] action install
    - install version 3.03-8.el6 of package cowsay
Running handlers:
Running handlers complete
Chef Client finished, 1/1 resources updated in 01 minutes 25 seconds
```

GL: Run cowsay with a Message



```
$ cowsay will moo for food
```

```
_____  
< will moo for food >  
-----  
      \  ^__^  
       \  (oo)\_____  
          (__)\       )\/\  
             ||----w |  
             ||     ||
```

Discussion



1. What would happen if you applied the recipe again?
2. What would happen if the package were to become uninstalled?

CONCEPT

Test and Repair

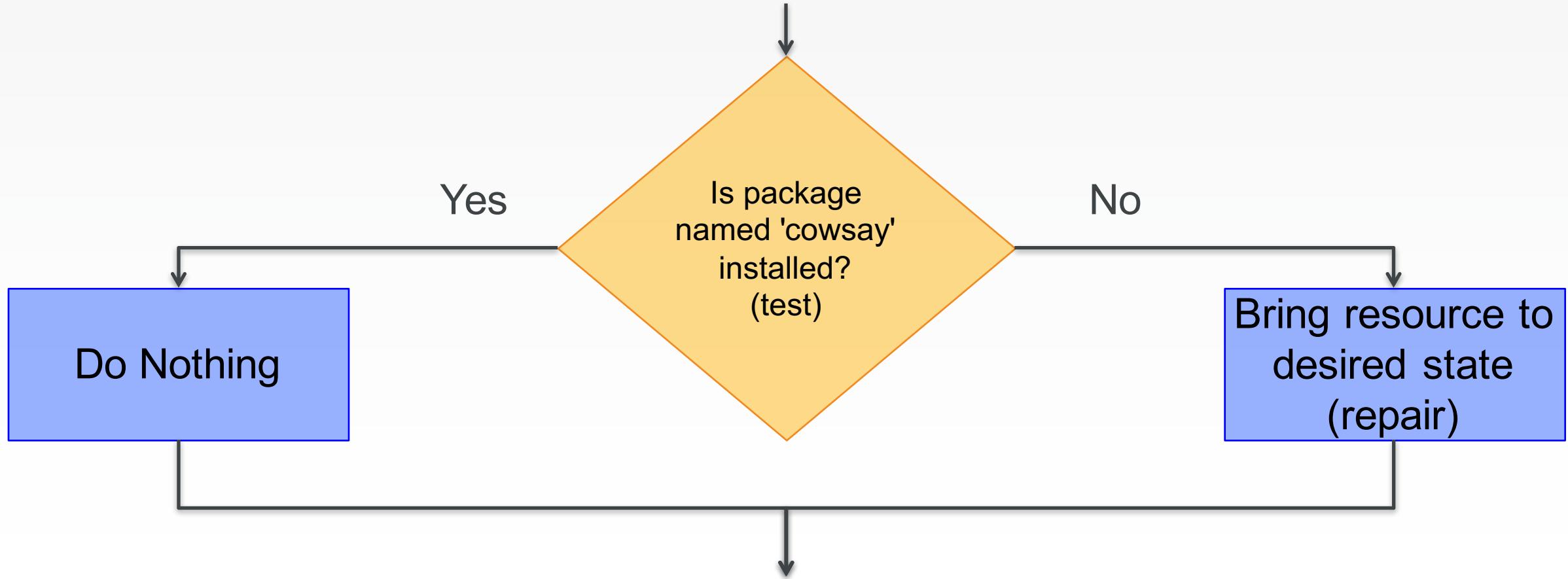


`chef-client` takes action only when it needs to.
Think of it as test and repair.

Chef looks at the current state of each resource
and takes action only when that resource is out of
policy.

Test and Repair

`package 'cowsay'`



Building Blocks: What is a Cookbook?

- A cookbook is a set of recipes
- A cookbook is a defined set of items and different outcomes that you expect to address

A cookbook could have a recipe to install apache2/httpd but also another set of recipes to activate modules required.

```
./attributes  
./attributes/default.rb  
./CHANGELOG.md  
./metadata.rb  
./README.md  
./recipes  
./recipes/application.rb  
./recipes/balancer.rb  
./recipes/database.rb  
./recipes/default.rb  
./recipes/webserver.rb  
./templates  
./templates/default  
./templates/default/mysite.conf.erb
```

GL: Create a Cookbooks Directory



```
$ mkdir cookbooks
```

GL: Let's Create a Cookbook



```
$ chef generate cookbook cookbooks/workstation
```

Generating cookbook workstation

- Ensuring correct cookbook file content
- Committing cookbook files to git
- Ensuring delivery configuration
- Ensuring correct delivery build cookbook content
- Adding delivery configuration to feature branch
- Adding build cookbook to feature branch
- Merging delivery content feature branch to master

Your cookbook is ready. Type `cd cookbooks/workstation` to enter it.

There are several commands you can run to get started locally developing and testing your cookbook.

Type `delivery local --help` to see a full list.

GL: The Cookbook Has a README



```
$ tree cookbooks/workstation
```

```
workstation
├── Berksfile
├── chefignore
├── metadata.rb
└── README.md
├── recipes
│   └── default.rb
└── spec
    ├── spec_helper.rb
    └── unit
        └── recipes
...
6 directories, 8 files
```

GL: The Cookbook Has a Folder for Recipes



```
$ tree cookbooks/workstation
```

```
workstation
├── Berksfile
├── chefignore
├── metadata.rb
├── README.md
└── recipes
    └── default.rb
├── spec
│   ├── spec_helper.rb
│   └── unit
│       └── recipes
...
6 directories, 8 files
```

GL: The Cookbook Has a Default Recipe



```
$ cat cookbooks/workstation/recipes/default.rb
```

```
# Cookbook Name:: workstation
# Recipe:: default
#
# Copyright (c) 2016 The Authors, All Rights Reserved.
```

Lab: Workstation Setup Recipe File

```
1 chef generate recipe cookbooks/setup.rb
```

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

file '/etc/motd' do
  content 'Property of ...
...
end
```

The package named 'tree' is installed.

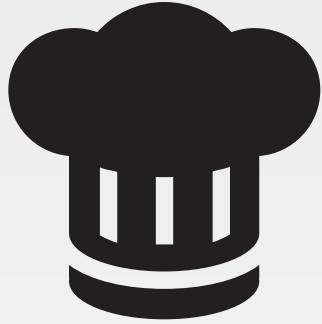
The file named '/etc/motd' is created with the content 'Property of ...'.



Managing a Large Number of Servers

Have you ever had to manage a large number of servers that were almost identical?

How about a large number of identical servers except that each one had to have host-specific information in a configuration file?



Details About the Node

Displaying system details in the MOTD definitely sounds useful.

Objective:

- ❑ Update the MOTD file contents, in the "workstation" cookbook, to include node details

EXAMPLE: Adding the CPU

1 ~/cookbooks/workstation/recipes/setup.rb

```
file '/etc/motd' do
  content 'Property of ...
  IPADDRESS: 104.236.192.102
  HOSTNAME : banana-stand
  MEMORY    : 502272 kB
  CPU       : 2399.998 MHz
  '
  mode '0644'
  owner 'root'
  group 'root'
end
```



Hard Coded Values

The values that we have derived at this moment may not be the correct values when we deploy this recipe again even on the same system!



Data In Real Time

How could we capture this data in real-time?

CONCEPT

Ohai!



Ohai is a tool that already captures all the data that we similarly demonstrated finding.

<http://docs.chef.io/ohai.html>

Ohai!



```
$ ohai
```

```
{  
  "kernel": {  
    "name": "Linux",  
    "release": "2.6.32-431.1.2.0.1.el6.x86_64",  
    "version": "#1 SMP Fri Dec 13 13:06:13 UTC 2013",  
    "machine": "x86_64",  
    "os": "GNU/Linux",  
    "modules": {  
      "veth": {  
        "size": "5040",  
        "refcount": "0"  
      },  
      "ipt_addrtype": {  
        "size": "5040",  
        "refcount": "0"  
      }  
    }  
  }  
}
```

CONCEPT

ohai + chef-client = <3



chef-client and chef-apply automatically executes ohai and stores the data about the node in an object we can use within the recipes named node.

<http://docs.chef.io/ohai.html>

CONCEPT

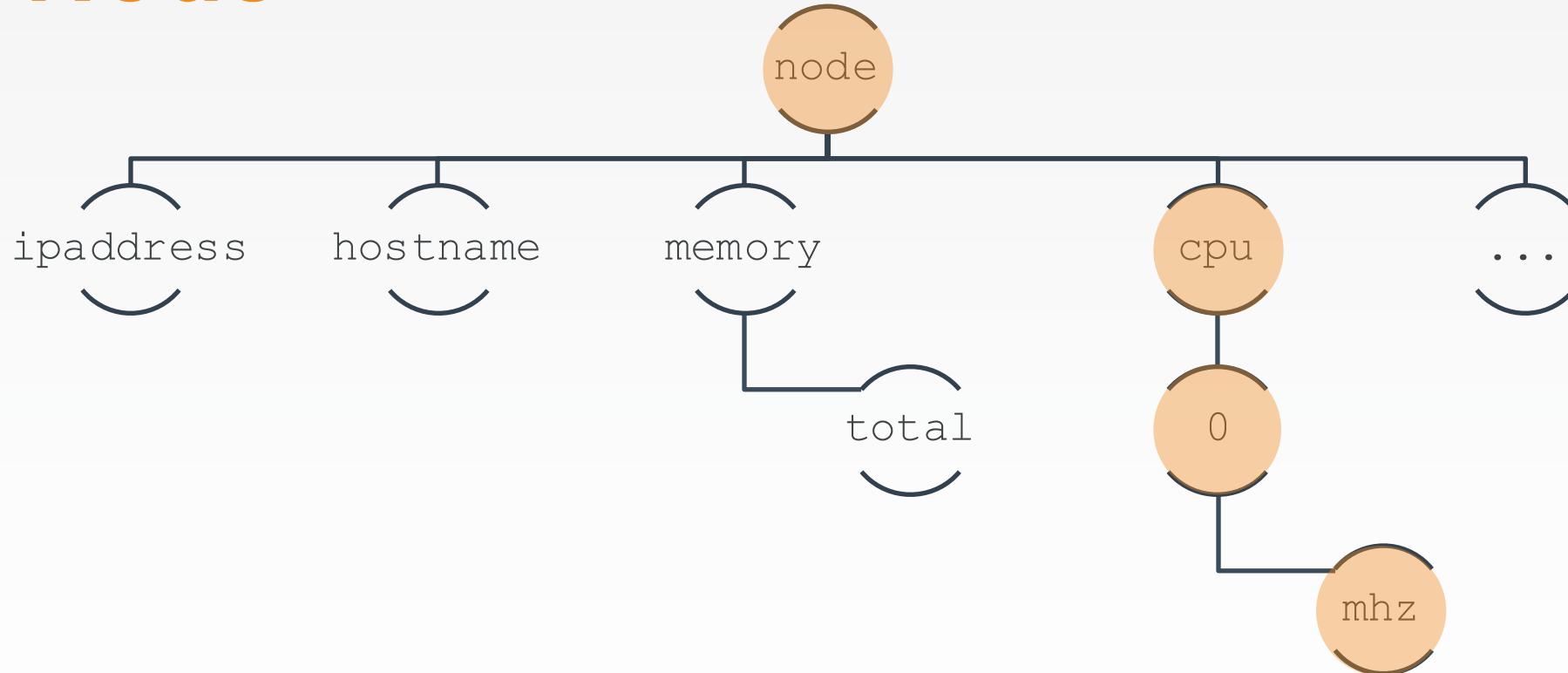
The Node Object



The node object is a representation of our system.
It stores all the attributes found about the system.

<http://docs.chef.io/nodes.html#attributes>

The Node



CPU: 2399.998MHz

```
"CPU: #{node['cpu']['0']['mhz']}
```

GL: Using the Node's Attributes

1 ~./cookbooks/workstation/recipes/setup.rb

```
# ... PACKAGE RESOURCES ...

file '/etc/motd' do
  content "Property of ...
  ^

  IPADDRESS: #{node['ipaddress']}
  HOSTNAME : #{node['hostname']}
  MEMORY    : #{node['memory']['total']}
  CPU       : #{node['cpu'][0]['mhz']}
  "
  mode '0644'
  owner 'root'
  group 'root'
end
```

GL: The Cookbook Has Some Metadata



```
$ tree cookbooks/workstation
```

```
workstation
├── Berksfile
├── chefignore
├── metadata.rb
├── README.md
├── recipes
│   └── default.rb
└── spec
    ├── spec_helper.rb
    └── unit
        └── recipes
...
6 directories, 8 files
```

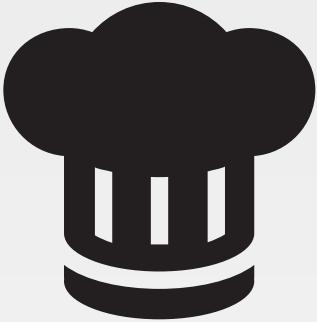
GL: Let's Take a Look at the Metadata



```
$ cat cookbooks/workstation/metadata.rb
```

```
name          'workstation'
maintainer    'The Authors'
maintainer_email 'you@example.com'
license        'all_rights'
description    'Installs/Configures workstation'
long_description 'Installs/Configures workstation'
version        '0.1.0'
```

```
# If you upload to Supermarket you should set this so your cookbook
# gets a `View Issues` link
# issues_url 'https://github.com/<insert_org_here>/workstation/issues' if
respond_to?(:issues_url)
```



Changes Mean a New Version

Let's bump the version number and check in the code to source control.

Objective:

- Update the version of the "workstation" cookbook
- Commit the changes to the "workstation" cookbook to version control

CONCEPT

Cookbook Versions



A cookbook version represents a set of functionality that is different from the cookbook on which it is based.

https://docs.chef.io/cookbook_versions.html

CONCEPT

Semantic Versions



Given a version number **MAJOR.MINOR.PATCH**, increment the:

- **MAJOR** version when you make incompatible API changes
- **MINOR** version when you add functionality in a backwards-compatible manner
- **PATCH** version when you make backwards-compatible bug fixes

<http://semver.org>



Major, Minor, or Patch?

What kind of changes did you make to the cookbook?

GL: Update the Cookbook Version

```
1 ~/cookbooks/workstation/metadata.rb
```

```
name          'workstation'  
maintainer    'The Authors'  
maintainer_email 'you@example.com'  
license        'all_rights'  
description    'Installs/Configures  
workstation'  
long_description 'Installs/Configures  
workstation'  
version      '0.2.0'
```



Lab: Setting up a Web Server

- ❑ Use `chef generate` to create a cookbook named "apache".
- ❑ Write and apply a recipe named "**server.rb**" with the policy:
 - The package named 'httpd' is installed.
 - The file named '/var/www/html/index.html' is created with the content '`<h1>Hello, world!</h1>`'
 - The service named 'httpd' is started and enabled.
- ❑ Apply the recipe with `chef-client`
- ❑ Verify the site is available by running `curl localhost`

Lab: Use Chef Generate to Create a Cookbook



```
$ chef generate cookbook cookbooks/apache
```

Generating cookbook apache

- Ensuring correct cookbook file content
- Committing cookbook files to git
- Ensuring delivery configuration
- Ensuring correct delivery build cookbook content
- Adding delivery configuration to feature branch
- Adding build cookbook to feature branch
- Merging delivery content feature branch to master

Your cookbook is ready. Type `cd cookbooks/apache` to enter it.

There are several commands you can run to get started locally developing and testing your cookbook.

Type `delivery local --help` to see a full list.

Lab: Use chef generate to Create a Recipe



```
$ chef generate recipe cookbooks/apache server
```

```
Compiling Cookbooks...

Recipe: code_generator::recipe
  * directory[cookbooks/apache/spec/unit/recipes] action create (up to date)
  * cookbook_file[cookbooks/apache/spec/spec_helper.rb] action create_if_missing
    (up to date)
  * template[cookbooks/apache/spec/unit/recipes/server_spec.rb] action
    create_if_missing
    - create new file cookbooks/apache/spec/unit/recipes/server_spec.rb
    - update content in file cookbooks/apache/spec/unit/recipes/server_spec.rb
      from none to a43970
      (diff output suppressed by config)
  * template[cookbooks/apache/recipes/server.rb] action create
    - create new file cookbooks/apache/recipes/server.rb
    - update content in file cookbooks/apache/recipes/server.rb from none to
      3d6b92
```

Lab: Create the Server Recipe

1 ~./cookbooks/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
```

Lab: Apply the Server Recipe



```
$ sudo chef-client -z cookbooks/apache/recipes/server.rb
```

```
Converging 3 resources
```

```
Recipe: @recipe_files:::/home/chef/cookbooks/apache/recipes/server.rb
```

```
* yum_package[httpd] action install
  - install version 2.2.15-47.el6.centos.3 of package httpd
* file[/var/www/html/index.html] action create
  - create new file /var/www/html/index.html
  - update content in file /var/www/html/index.html from none to 17d291
    --- /var/www/html/index.html      2016-02-24 21:41:45.494844958 +0000
    +++ /var/www/html/.index.html20160224-10036-6y8on7      2016-02-24
21:41:45.493844958 +0000
  @@ -1 +1,2 @@
  +<h1>Hello, world!</h1>
* service[httpd] action enable
  - enable service service[httpd]
```

Lab: Verify That the Website is Available



```
$ curl localhost
```

```
<h1>Hello, world!</h1>
```

Demo: Using 'chef-client' to Locally Apply Recipes

```
$ sudo chef-client --local-mode \
-r "recipe[workstation::setup],recipe[apache::server]"
```

Applying the following recipes locally:

- The 'setup' recipe from the 'workstation' cookbook
- The 'server' recipe from the 'apache' cookbook

GL: Apply Both Recipes Locally



```
$ sudo chef-client --local-mode \
-r "recipe[apache::server], recipe[workstation::setup]"
```

```
[2016-09-15T15:17:27+00:00] WARN: No config file found or specified on
command line, using command line options.

Starting Chef Client, version 12.13.37
resolving cookbooks for run list: ["apache::server", "workstation::setup"]
Synchronizing Cookbooks:
  - apache
  - workstation

Compiling Cookbooks...
Running handlers:
...
...
```



include_recipe

A recipe can include one (or more) recipes located in cookbooks by using the `include_recipe` method. When a recipe is included, the resources found in that recipe will be inserted (in the same exact order) at the point where the `include_recipe` keyword is located.

<https://docs.chef.io/recipes.html#include-recipes>

GL: The Default Recipe Includes the Setup Recipe

```
1 ~./cookbooks/workstation/recipes/default.rb
```

```
#  
# Cookbook Name:: workstation  
# Recipe:: default  
#  
# Copyright (c) 2016 The Authors, All Rights Reserved.  
  
include_recipe 'workstation::setup'
```

Lab: The Default Recipe Includes the Apache Recipe

1 ~/cookbooks/apache/recipes/default.rb

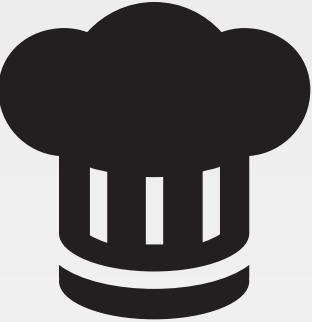
```
#  
# Cookbook Name:: apache  
# Recipe:: default  
#  
# Copyright (c) 2016 The Authors, All Rights Reserved.  
  
include_recipe 'apache::server'
```

Lab: Applying the apache Default Recipe



```
$ sudo chef-client --local-mode -r "recipe[apache]"
```

```
[2016-09-15T15:23:18+00:00] WARN: No config file found or specified on command  
line, using command line options.  
Starting Chef Client, version 12.13.37  
resolving cookbooks for run list: ["apache"]  
Synchronizing Cookbooks:  
  - apache (0.1.0)  
Compiling Cookbooks...  
Converging 3 resources  
  
Running handlers:  
Running handlers complete  
Chef Client finished, 0/3 resources updated in 3.310768509 seconds
```



Changes Mean a New Version

Let's bump the version number

Objective:

- Update the version of the "workstation" cookbook



Discussion

Why would you want to apply more than one recipe at a time?

What are the benefits and drawbacks of using "`include_recipe`" within a recipe?

Do default values make it easier or harder to learn?



Q&A

What questions can we help you answer?

- chef-client
- local mode
- run list
- include_recipe

Testing Cookbooks

Validating Our Recipes in Virtual Environments

Syntax testing: `cookstyle`

Later in this course you will learn about Test Kitchen and how it can be used to test cookbook data across a combination of platforms and test suites.

But what if you want to do a quick syntax test of your recipe?

That's where `cookstyle` can come in handy.

`cookstyle` is a linting tool based on RuboCop that comes with ChefDK.

Simply run `cookstyle` from the directory where your recipe resides and it will indicate any syntax offenses.

<https://docs.chef.io/release/devkit/cookstyle.html>

Example: cookstyle



```
$ cookstyle
```

```
Inspecting 1 file
```

```
C
```

```
Offenses:
```

```
server.rb:10:1: C: 1 trailing blank lines detected.
```

```
1 file inspected, 1 offense detected
```

In this example, we ran `cookstyle` against the server.rb recipe we created in this module. `cookstyle` has detected a trailing blank line, although it's not a critical error.

Example: cookstyle



```
$ cookstyle
```

```
Inspecting 6 files
```

```
...C...
```

```
Offenses:
```

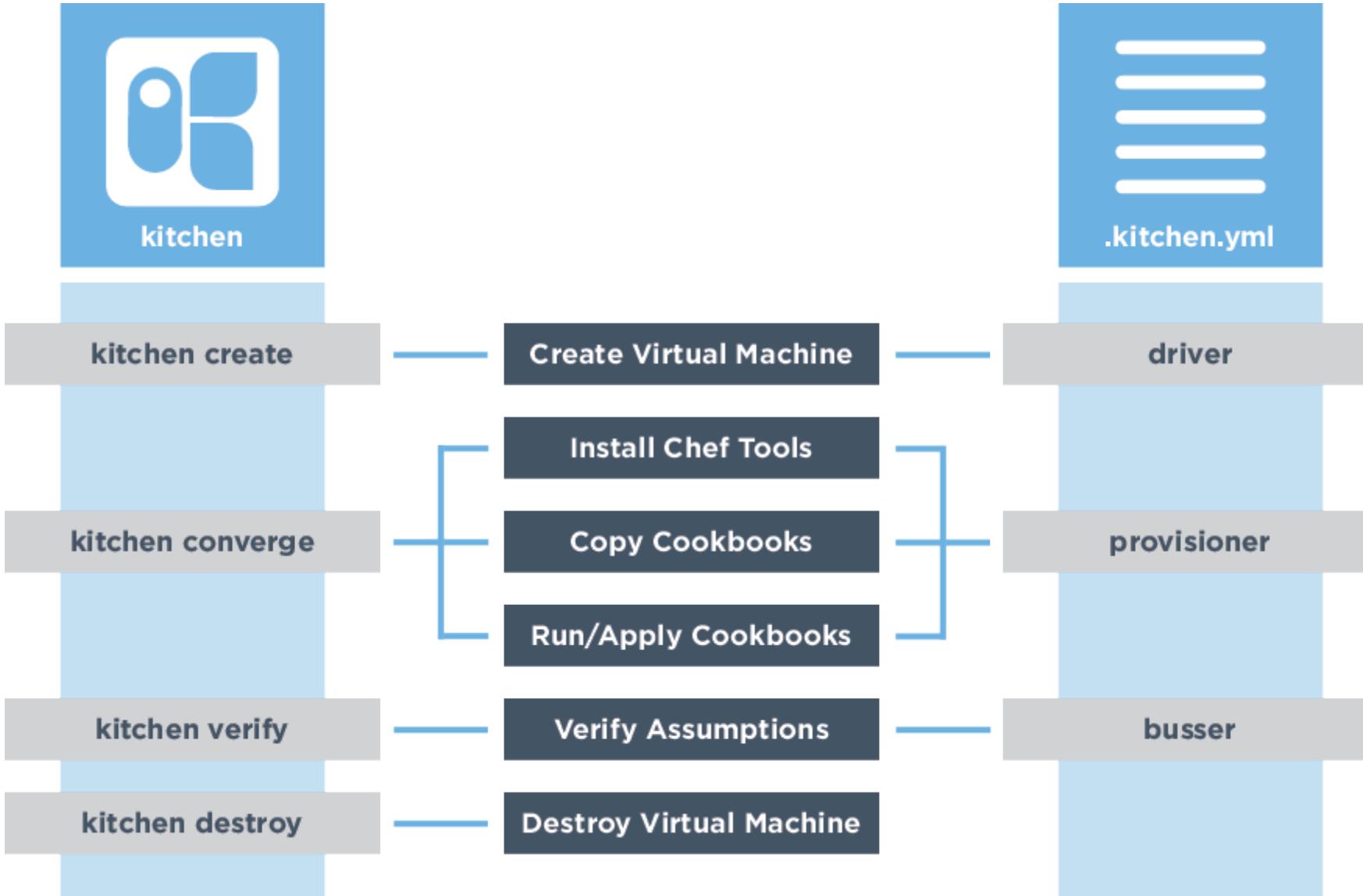
```
recipes/default.rb:13:27: C: Trailing whitespace detected.
```

```
    action [:start, :enable]
```

```
    ^
```

In this example from a different recipe, `cookstyle' even shows via the caret where the trailing whitespace exists.

Test Kitchen Commands and Configuration



What Can 'kitchen' Do?



```
$ kitchen --help
```

Commands :

```
kitchen console                                # Kitchen Console!
kitchen converge [INSTANCE|REGEXP|all]          # Converge one or more instances
kitchen create [INSTANCE|REGEXP|all]              # Create one or more instances
kitchen destroy [INSTANCE|REGEXP|all]             # Destroy one or more instances
...
kitchen help [COMMAND]                          # Describe available commands or one specif...
kitchen init                                    # Adds some configuration to your cookbook...
kitchen list [INSTANCE|REGEXP|all]                # Lists one or more instances
kitchen setup [INSTANCE|REGEXP|all]               # Setup one or more instances
kitchen test [INSTANCE|REGEXP|all]                 # Test one or more instances
kitchen verify [INSTANCE|REGEXP|all]               # Verify one or more instances
kitchen version                                 # Print Kitchen's version information
```

CONCEPT

.kitchen.yml



When chef generates a cookbook, a default .kitchen.yml is created. It contains kitchen configuration for the driver, provisioner, platform, and suites.

<http://kitchen.ci/docs/getting-started/creating-cookbook>

Each cookbook has a .kitchen.yml



```
$ tree cookbooks/workstation -a
```

```
...
├── .kitchen.yml
├── metadata.rb
├── README.md
├── recipes
│   ├── default.rb
│   └── setup.rb
├── spec
│   ├── spec_helper.rb
│   └── unit
│       └── recipes
│           └── default_spec.rb
└── test
```

What is Inside .kitchen.yml?



```
$ cat cookbooks/workstation/.kitchen.yml
```

```
---
```

```
driver:
```

```
  name: vagrant
```



```
provisioner:
```

```
  name: chef_zero
```



```
verifier:
```

```
  name: inspec
```



```
platforms:
```

```
  - name: ubuntu-16.04
```

```
  - name: centos-7.2
```

GL: Edit the Workstation Kitchen Configuration

File ~ / cookbooks / workstation / . kitchen . yml

```
---
```

```
driver:
```

```
  name: docker
```

```
provisioner:
```

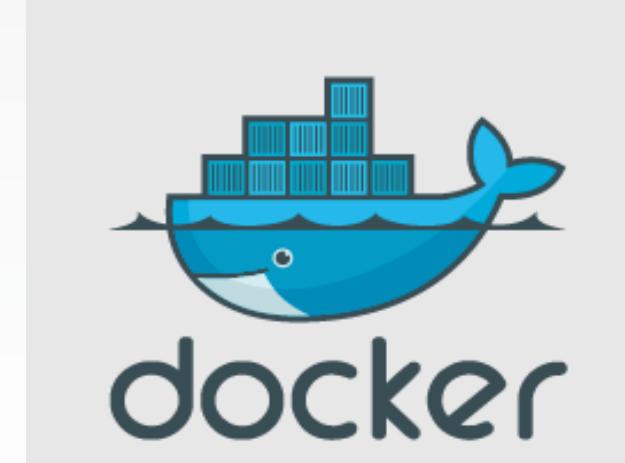
```
  name: chef_zero
```

```
verifier:
```

```
  name: inspec
```

```
platforms:
```

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



tech/kitchen-docker

GL: Converge the Cookbook



```
$ kitchen converge
```

```
----> Starting Kitchen (v1.11.0)
----> Creating <default-centos-67>...
      Sending build context to Docker daemon 193 kB
(skippping)
----> Finished creating <default-centos-67> (1m18.32s).
----> Converging <default-centos-67>...
$$$$$ Running legacy converge for 'Docker' Driver
(skippping)
Synchronizing Cookbooks:
  - workstation (0.1.0)
Compiling Cookbooks...
Converging 2 resources
Running handlers:
```

Lab: Configuring Test Kitchen for Apache

```
1 ~/cookbooks/apache/.kitchen.yml
```

```
---
```

```
driver:
```

```
  name: docker
```

```
provisioner:
```

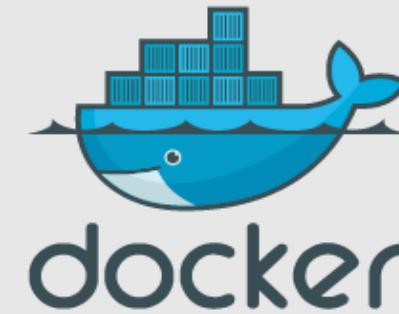
```
  name: chef_zero
```

```
verifier:
```

```
  name: inspec
```

```
platforms:
```

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



Lab: Converge the Cookbook

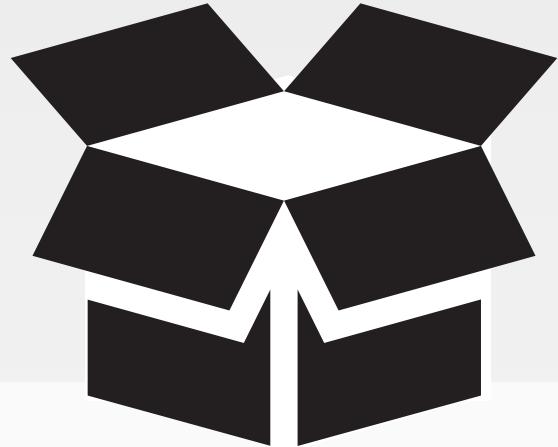


```
$ kitchen converge
```

```
-----> Starting Kitchen (v1.11.0)
-----> Creating <default-centos-67>...
      Sending build context to Docker daemon 194 kB
      Sending build context to Docker daemon
      (skipping)
      Installing Chef
          installing with rpm...
          warning: /tmp/install.sh.23/chef-12.13.37-1.el6.x86_64.rpm: Header V4
DSA/SHA1 Signature, key ID 83ef826a: NOKEY
      (skipping)
      Synchronizing Cookbooks:
          - apache (0.1.0)
      Compiling Cookbooks...
```

ALL OF THE KITCHEN COMMANDS

Kitchen Test



kitchen
destroy

kitchen
create

kitchen
converge

kitchen
verify

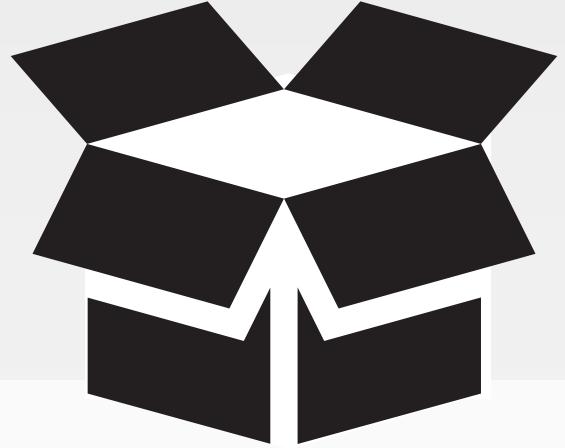
kitchen
destroy

```
$ kitchen test [INSTANCE | REGEXP | all]
```

Destroys (for clean-up), creates, converges, verifies and then destroys one or more instances.

CONCEPT

Kitchen Create



kitchen
create

kitchen
converge

kitchen
verify

```
$ kitchen create [INSTANCE|REGEXP|all]
```

Create one or more instances.

CONCEPT

Kitchen Converge



kitchen
create

kitchen
converge

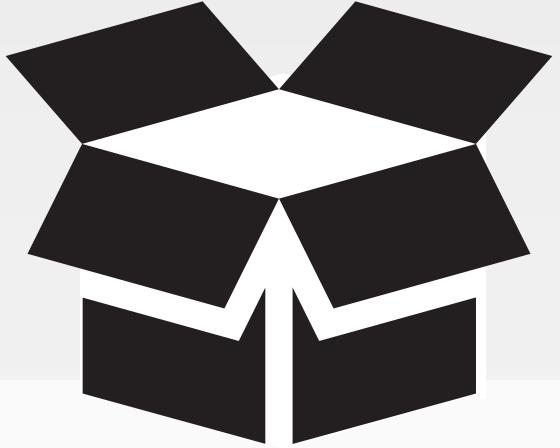
kitchen
verify

```
$ kitchen converge [INSTANCE|REGEXP|all]
```

Create the instance (if necessary) and then apply the run list to one or more instances.

CONCEPT

Kitchen Verify



kitchen
create

kitchen
converge

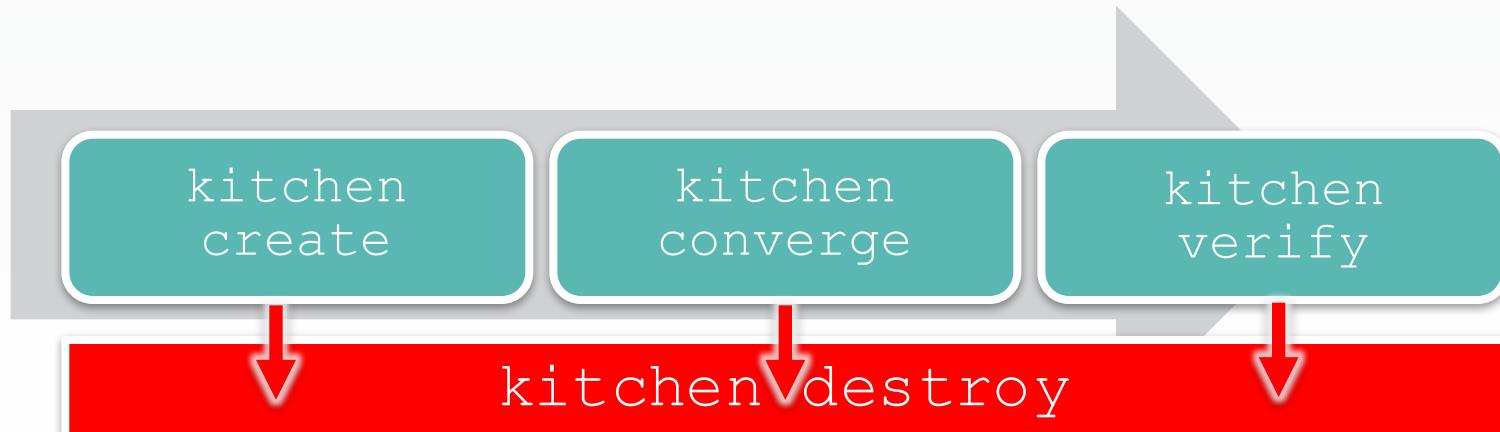
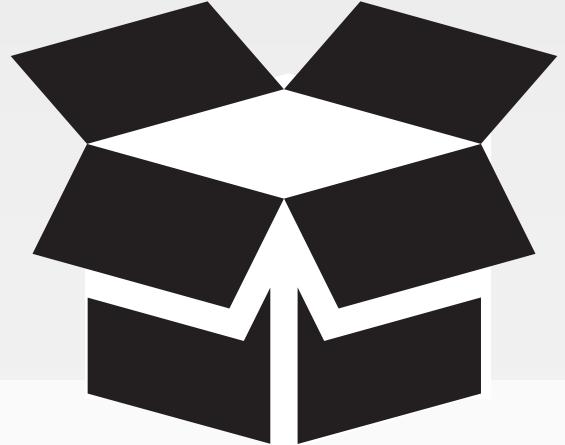
kitchen
verify

```
$ kitchen verify [INSTANCE|REGEXP|all]
```

Create, converge, and verify one or more instances.

CONCEPT

Kitchen Destroy



```
$ kitchen destroy [INSTANCE | REGEXP | all]
```

Destroys one or more instances.

CONCEPT

Where do Tests Live?



`workstation/test/recipes/default_test.rb`

Test Kitchen will look for tests to run under this directory.

This is configurable in the kitchen configuration file (.kitchen.yml) in the suites section.

CONCEPT

InSpec



InSpec tests your servers' actual state by executing command locally, via SSH, via WinRM, via Docker API and so on.

<http://inspec.io/>

Example: Is the 'tree' Package Installed?

```
describe package('tree') do
  it { should be_installed }
end
```

I expect the package tree should be installed.

<http://inspec.io/docs/reference/resources/#id118>

GL: Example Tests

1 ~/cookbooks/workstation/test/recipes/default_test.rb

```
unless os.windows?  
  describe user('root') do  
    it { should exist }  
    skip 'This is an example...test.'  
  end  
end  
  
describe port(80) do  
  it { should_not be_listening }  
  skip 'This is an example... test.'  
end
```

When not on windows a user named `root` should exist.

The port 80 should not be listening for incoming connections.

GL: Describing the Resources

1 ~ / cookbooks / workstation / test / recipes / default _ test . rb

```
unless os.windows?  
  describe user('root') do  
    it { should exist }  
    skip 'This is an example...test.'  
  end  
end  
  
describe port(80) do  
  it { should_not be_listening }  
  skip 'This is an example... test.'  
end
```

A user named 'root'

The port 80

<https://relishapp.com/rspec/rspec-core/v/3-3/docs>

GL: Describing the State of the Resources

1 ~ / cookbooks / workstation / test / recipes / default _ test . rb

```
unless os.windows?  
  describe user('root') do  
    it { should exist }  
    skip 'This is an example...test.'  
  end  
end  
  
describe port(80) do  
  it { should_not be_listening }  
  skip 'This is an example... test.'  
end
```

The user named 'root' should exist.

The port 80 should not be listening.

<https://relishapp.com/rspec/rspec-core/v/3-3/docs>

GL: The `skip` Reminds Us to Remove These Tests

1

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

```
unless os.windows?  
  describe user('root') do  
    it { should exist }  
    skip 'This is an example...test.'  
  end  
end  
  
describe port(80) do  
  it { should_not be_listening }  
  skip 'This is an example... test.'  
end
```

skip will show a message in the test results.

These skips will remind you that the following expectations are only examples.

GL: Adding a New Test

```
1] ~/cookbooks/workstation/test/recipes/default_test.rb
```

```
unless os.windows?  
  describe user('root') do  
    it { should exist }  
    skip 'This is an example...test.'  
  end  
end  
  
describe port(80) do  
  it { should_not be_listening }  
  skip 'This is an example... test.'  
end  
  
describe package('tree') do  
  it { should be_installed }  
end
```

Lab: Our Assertion in a spec File

1 ~ / cookbooks / workstation / test / recipes / default _ test . rb

```
describe port(80) do
  it { should_not be_listening }
end

describe package('tree') do
  it { should be_installed }
end

describe file('/etc/motd') do
  its('content') { should match(/Property of/) }
end
```

Lab: Our Assertion in a spec File

1 ~./cookbooks/workstation/test/recipes/default_test.rb

```
describe port(80) do
  it { should_not be_listening }
end

describe package('tree') do
  it { should be_installed }
end

describe file('/etc/motd') do
  its('content') { should match(/Property of/) }
  it { should be_owned_by 'root' }
end
```

Lab: What Does the Webserver Say?

1 ~ / cookbooks / apache / 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(80) do
  it { should be_listening }

  skip 'This is an example test, replace with your own test.'

end
```

Lab: What Does the Webserver Say?

```
1 ~$ cd ~/cookbooks/apache/test/recipes
```

```
describe port(80) do
  it { should be_listening }
  skip 'This is an example test, replace with your own test.'
end
```

```
describe command('curl localhost') do
  its('stdout') { should match('Hello, world') }
end
```

Lab: Remove the server test file



```
$ rm test/recipes/server.rb
```



Discussion

Why do you have to run kitchen within the directory of the cookbook?

Where would you define additional platforms?

Why would you define a new test suite?

What are the limitations of using Test Kitchen to validate recipes?



Q&A

What questions can we help you answer?

- Test Kitchen
- kitchen commands
- kitchen configuration
- InSpec

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