Chef Fundamentals

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Webinar Objectives and Style

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Multi-week Webinar Series

- After completing of this webinar series you will be able to
  - Automate common infrastructure tasks with Chef
  - Describe Chef's architecture
  - Describe Chef's various tools
  - Apply Chef's primitives to solve your problems
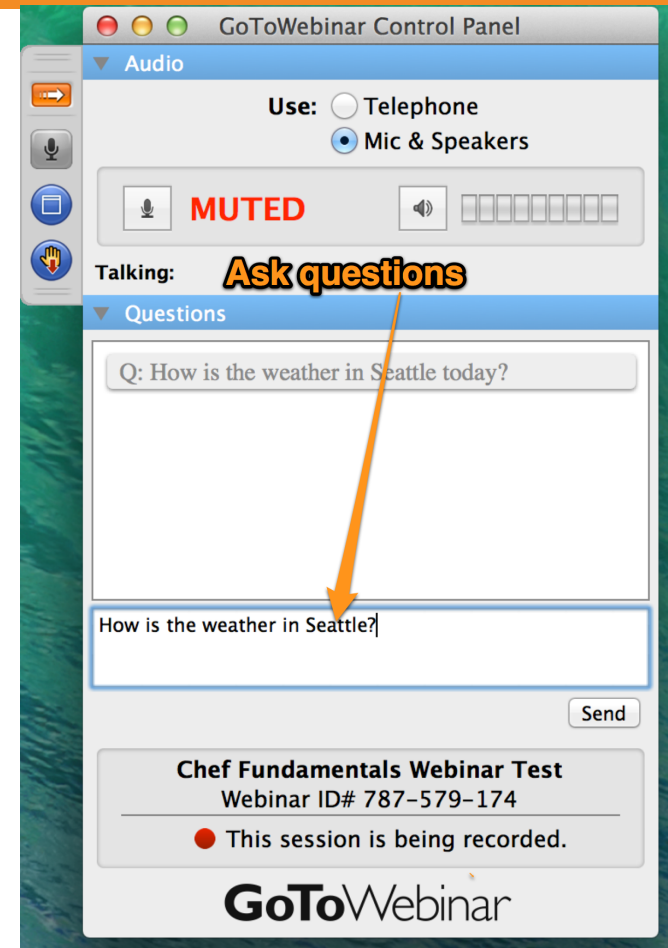
How to learn Chef

- You bring the domain expertise about your business and infrastructure

- Chef provides a framework for automating your infrastructure

- Our job is to work together to teach you how to model and automate your infrastructure with Chef

Chef is a Language

- Learning Chef is like learning the basics of a language
- 80% fluency will be reached very quickly
- The remaining 20% just takes practice
- The best way to **learn** Chef is to *use* Chef

Questions & Answers

- Ask questions in the chat window when they come to you
  - We'll answer as many questions as we can at the end of the session

Questions & Answers

- Ask questions in the Google Discussion Forum

- This can be used during the webinar and outside of the webinar, too.

- https://groups.google.com/d/forum/learnchef-fundamentals-webinar

Slides and Video

- This webinar is being recorded. The video will be made available shortly after the session has ended.

- The slides used throughout this webinar will be made available at the end of each webinar.

- Watch http://learnchef.com for updates.

Agenda

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Topics

- ~~Overview of Chef~~
- ~~Workstation Setup~~
- ~~Node Setup~~
- ~~Chef Resources and Recipes~~
- ~~Working with the Node object~~
- ~~Roles~~
- Common configuration with Data Bags - **Today**
- Environments
- Community Cookbooks and Further Resources

Quick Recap

Where are we?

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In the last module

- Login to the node in your Chef Training Lab
- Install Chef nodes using "`knife bootstrap`"
  - Included a `run_list` so that the server was a web server when the bootstrap process completed
- Read and wrote node attributes

Where did my Node go?

- We still need a CentOS machine to manage

- The one we launched last time has likely expired

- Launch a new one using the Chef Lab

  - Hopefully, you've already done this. We're not going to spend time walking through it now.

Launch Chef Training Lab

cloudshare

Home Overview CentOS 6.3 Server Virtual Machines

Environment is ready

learnchef tutorial - CentOS

Your dedicated hands-on environment is just a click away.

We believe you shouldn't have to waste time copying gigabytes of software, shipping machines, or traveling, just to get your IT into people's hands.

When you click the 'Start Using' button to your right, you'll have instant access worldwide to a full, enterprise-grade IT

Start Using This Environment

Lab - Login

```
$ ssh root@<EXTERNAL_ADDRESS>
```

```
The authenticity of host 'uvo1qrwls0jdgs3blvt.vm.cld.sr
(69.195.232.110)' can't be established.
RSA key fingerprint is d9:95:a3:b9:02:27:e9:cd:
74:e4:a2:34:23:f5:a6:8b.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'uvo1qrwls0jdgs3blvt.vm.cld.sr,
69.195.232.110' (RSA) to the list of known hosts.
chef@uvo1qrwls0jdgs3blvt.vm.cld.sr's password:
Last login: Mon Jan  6 16:26:24 2014 from
host86-145-117-53.range86-145.btcentralplus.com
[chef@CentOS63 ~]$
```

Checkpoint

- At this point you should have
  - One virtual machine (VM) or server that you'll use for the lab exercises
  - The IP address or public hostname
  - An application for establishing an ssh connection
  - 'sudo' or 'root' permissions on the VM

"Bootstrap" the Target Instance

```
$ knife bootstrap <EXTERNAL_ADDRESS> -x root -P chef -N 'module4' -r 'role[webserver]'
```

```
Bootstrapping Chef on uvo1qrwls0jdgs3blvt.vm.cld.sr
...
...
uvo1qrwls0jdgs3blvt.vm.cld.sr Creating a new client identity for
module3 using the validator key.
uvo1qrwls0jdgs3blvt.vm.cld.sr resolving cookbooks for run list: []
uvo1qrwls0jdgs3blvt.vm.cld.sr Synchronizing Cookbooks:
uvo1qrwls0jdgs3blvt.vm.cld.sr Compiling Cookbooks...
uvo1qrwls0jdgs3blvt.vm.cld.sr [2014-01-28T11:03:14-05:00] WARN: Node
module3 has an empty run list.
uvo1qrwls0jdgs3blvt.vm.cld.sr Converging 0 resources
uvo1qrwls0jdgs3blvt.vm.cld.sr Chef Client finished, 0 resources updated
```

Exercise: Verify that the home page works

- Open a web browser
- Type in the the URL for your test node

http://uvo1ij6khv...88vxtq.vm.cld.sr/

uvo1ij6khvllg88vxtq.vm.cld.sr
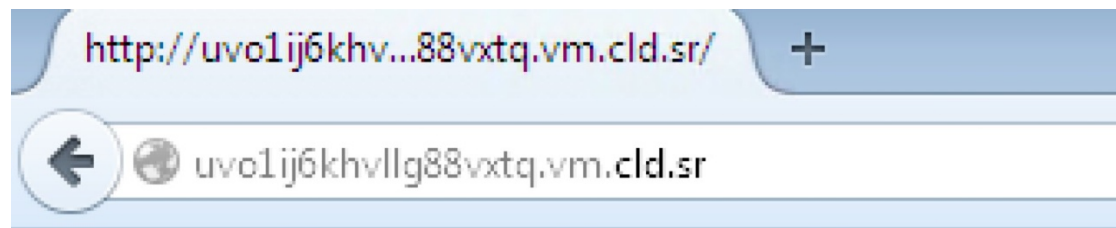
Hello, Webinar!

My name is CentOS63.

Data Bags

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Lesson Objectives

- After completing the lesson, you will be able to
  - Use Data Bags for data-driven recipes
  - Use multiple recipes for a node's run list

Data Bags are generic stores of information

- Data Bags are generic, arbitrary stores of information about the infrastructure
- Data Bag Items are **JSON** data
- Our **apache** cookbook provides a good baseline
- We'll drive **site-specific** virtual hosts with data bags

Create a directory for Data Bags

```
$ mkdir -p data_bags/vhosts
```

Add a Data Bag Item

OPEN IN EDITOR: data_bags/vhosts/bears.json

```json
{
    "id" : "bears",
    "port" : 80
}
```

SAVE FILE!

Add a Data Bag Item

OPEN IN EDITOR: data_bags/vhosts/clowns.json

```json
{
  "id" : "clowns",
  "port" : 81
}
```

SAVE FILE!

Upload the data bags

```
$ knife upload data_bags/vhosts
```

```
Created data_bags/vhosts
Created data_bags/vhosts/bears.json
Created data_bags/vhosts/clowns.json
```

A new recipe for virtual hosts

- We'll create an *apache::vhosts* recipe to manage the virtual hosts we created in data bag items
- There's a number of new things to talk about in this recipe
- We'll take this nice and slow :)

Create a vhosts recipe

OPEN IN EDITOR: cookbooks/apache/recipes/vhosts.rb

```ruby
data_bag("vhosts").each do |site|
  site_data = data_bag_item("vhosts", site)
  site_name = site_data["id"]
  document_root = "/srv/apache/#{site_name}"
end
```

SAVE FILE!

Add a Virtual Hosts Configuration Template

📄 **OPEN IN EDITOR:** cookbooks/apache/recipes/vhosts.rb

```ruby
document_root = "/srv/apache/#{site_name}"

template "/etc/httpd/conf.d/#{site_name}.conf" do
    source "custom-vhosts.erb"
    mode "0644"
    variables(
        :document_root => document_root,
        :port => site_data["port"]
    )
    notifies :restart, "service[httpd]"
  end
end
```

SAVE FILE!

Add a directory resource

```ruby
end



  directory document_root do
    mode "0755"
    recursive true
  end
end
```

SAVE FILE!

Index for each vhost

```ruby
  end


  template "#{document_root}/index.html" do
    source "index.html.erb"
    mode "0644"
    variables(
      :site_name => site_name,
      :port => site_data["port"]
    )
  end
end
```

SAVE FILE!

Index for each vhost

https://gist.github.com/9134977

```ruby
  end


  template "#{document_root}/index.html" do
    source "index.html.erb"
    mode "0644"
    variables(
      :site_name => site_name,
      :port => site_data["port"]
    )
  end
end
```

SAVE FILE!

Index for each vhost

OPEN IN EDITOR: cookbooks/apache/templates/default/custom-vhosts.erb

```erb
<% if @port != 80 -%>
  Listen <%= @port %>
<% end -%>

<VirtualHost *:<%= @port %>>
  ServerAdmin webmaster@localhost

  DocumentRoot <%= @document_root %>
  <Directory />
    Options FollowSymLinks
    AllowOverride None
  </Directory>
  <Directory <%= @document_root %>>
    Options Indexes FollowSymLinks MultiViews
    AllowOverride None
    Order allow,deny
    allow from all
  </Directory>
</VirtualHost>
```
                              SAVE FILE!

Index for each vhost

📄 **OPEN IN EDITOR:** cookbooks/apache/templates/default/custom-vhosts.erb

```erb
<% if @port != 80 -%>
  Listen <%= @port %>
<% end -%>

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  ServerAdmin webmaster@localhost

  DocumentRoot <%= @document_root %>
  <Directory />
    Options FollowSymLinks
    AllowOverride None
  </Directory>
  <Directory <%= @document_root %>>
    Options Indexes FollowSymLinks MultiViews
    AllowOverride None
    Order allow,deny
    allow from all
  </Directory>
</VirtualHost>
```

https://gist.github.com/2866454

SAVE FILE!

Update the index.html template

```erb
<h1>Hello, <%= node['apache']['greeting'] %>!</h1>
<p>My name is <%= node['hostname'] %></p>
<p>We love <%= @site_name %></p>
<p>Served from <%= node['ipaddress'] %>:<%= @port %></p>
```

SAVE FILE!

Diff the cookbook

```
$ knife diff cookbooks/apache
```

```
diff --knife cookbooks/apache/templates/default/index.html.erb cookbooks/apache/templates/default/
index.html.erb
--- cookbooks/apache/templates/default/index.html.erb    2014-02-21 06:02:53.000000000 -0800
+++ cookbooks/apache/templates/default/index.html.erb    2014-02-21 06:02:53.000000000 -0800
@@ -1,3 +1,5 @@
 <h1>Hello, <%= node['apache']['greeting'] %>!</h1>
 <p>My name is <%= node['hostname'] %></p>
+<p>We love <%= @site_name %></p>
+<p>Served from <%= node['ipaddress'] %>:<%= @port %></p>
diff --knife cookbooks/apache/templates/default/custom-vhosts.erb cookbooks/apache/templates/
default/custom-vhosts.erb
new file
--- /dev/null    2014-02-21 06:02:53.000000000 -0800
+++ cookbooks/apache/templates/default/custom-vhosts.erb    2014-02-21 06:02:53.000000000 -0800
```

Update the metadata.rb

📄 **OPEN IN EDITOR:** cookbooks/apache/metadata.rb

```ruby
name              'apache'
maintainer        'YOUR_COMPANY_NAME'
maintainer_email  'YOUR_EMAIL'
license           'All rights reserved'
description       'Installs/Configures apache'
long_description IO.read(File.join(File.dirname(__FILE__), 'README.md'))
version           '0.2.0'
```

SAVE FILE!

Upload the cookbook

```
$ knife cookbook upload apache
```

```
Uploading apache              [0.2.0]
Uploaded 1 cookbook.
```

Update the webserver role

OPEN IN EDITOR: roles/webserver.json

```json
{
  "name" : "webserver",
  "default_attributes" : {
    "apache" : {
      "greeting" : "Webinar"
    }
  },
  "run_list" : [
    "recipe[apache]",
    "recipe[apache::vhosts]"
  ]
}
```

SAVE FILE!

Exercise: Update the role

```
Updated Role webserver!
```

Exercise: Update the role

```
$ knife role from file webserver.json
```

```
Updated Role webserver!
```

Run the chef-client on your test node

```
root@module4:~$ sudo chef-client
```

```
Starting Chef Client, version 11.10.4
resolving cookbooks for run list: ["apache", "apache::vhosts"]
Synchronizing Cookbooks:
  - apache
Compiling Cookbooks...
Converging 9 resources
Recipe: apache::default
  * package[httpd] action install (up to date)
  * service[httpd] action enable (up to date)
  * service[httpd] action start (up to date)
  * execute[mv /etc/httpd/conf.d/welcome.conf /etc/httpd/conf.d/welcome.conf.disabled] action run
(skipped due to only_if)
Recipe: apache::vhosts
  * template[/etc/httpd/conf.d/bears.conf] action create
    - create new file /etc/httpd/conf.d/bears.conf
    - update content in file /etc/httpd/conf.d/bears.conf from none to 416948
        --- /etc/httpd/conf.d/bears.conf         2014-02-21 09:20:53.592830069 -0500
        +++ /tmp/chef-rendered-template20140221-6294-y855dq      2014-02-21 09:20:53.594830068 -0500
```

Think about what we just did...

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- We had two virtual hosts...

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- We had two virtual hosts...
- But we could arbitrarily add more...

Think about what we just did...

- We had two virtual hosts...
- But we could arbitrarily add more...
- Tigers on port 82, Lions on port 83, oh my!

Checkpoint

- Our cookbook has two recipes, **default** and **vhosts**
- Additional data bags can be added, expanding our Virtual Hosting empire!

Six Week Series

- Module 1 - Overview of Chef
- Module 2 - Node Setup, Chef Resources & Recipes
- Module 3 - Working with the Node object & Roles
- Today - Common configuration data with Databags
- June 17 - Environments
- June 24 - Community Cookbooks and Further Resources

- * Topics subject to change, schedule unlikely to change

Sign-up for Webinar

- http://pages.getchef.com/
cheffundamentalsseries.html

Chef Fundamentals Series

Join Chef's Community Director, Nathen Harvey as he teaches you the fundamentals of using Chef. This series will start with an overview of Chef and by the end you will be converging all the nodes you want!

This series will include hands-on labs, homework exercises, question/answer time and lectures all designed to help you learn Chef.

The first session starts May 20 at 10am PCT and will run for 6 weeks for about an hour each session.

Sessions will cover:

- Workstation and Test Node Setup
- Writing Cookbooks
- Using Roles and Environments
- Further resources for working with Chef

First Name: *

Last Name: *

Email Address: *

Company Name:

Job Title:

Submit

Additional Resources

- Chef Fundamentals Webinar Series

- https://www.youtube.com/watch?v=S5lHUpzoCYo&list=PL11cZfNdwNyPnZA9D1MbVqIdGuOWqbumZ

- Discussion group for webinar participants

- https://groups.google.com/d/forum/learnchef-fundamentals-webinar

Additional Resources

- Learn Chef
- http://learnchef.com

- Documentation
- http://docs.opscode.com

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