

Chef Fundamentals

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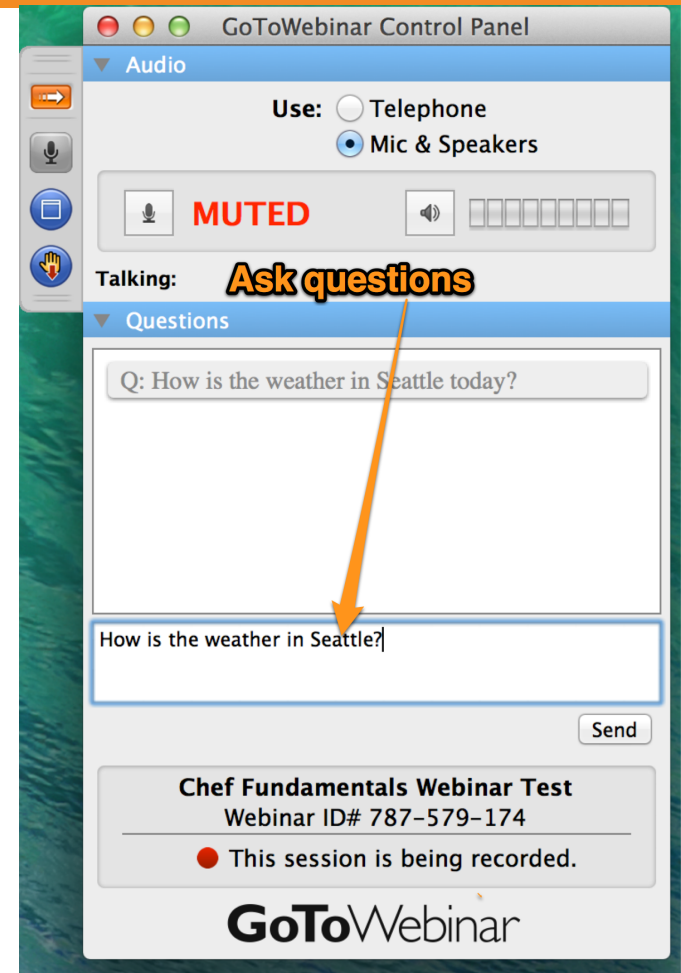
Nathen Harvey

- Community Director
- Co-host of the Food Fight Show Podcast
- @nathenharvey



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>








learnchef-fundamentals-webinar Shared publicly

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Welcome to the discussion forum for the [#learnchef Chef Fundamentals w](#)

Use this forum to ask questions about the webinar series, get homework to

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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.

Topics

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

Quick Recap

Where are we?

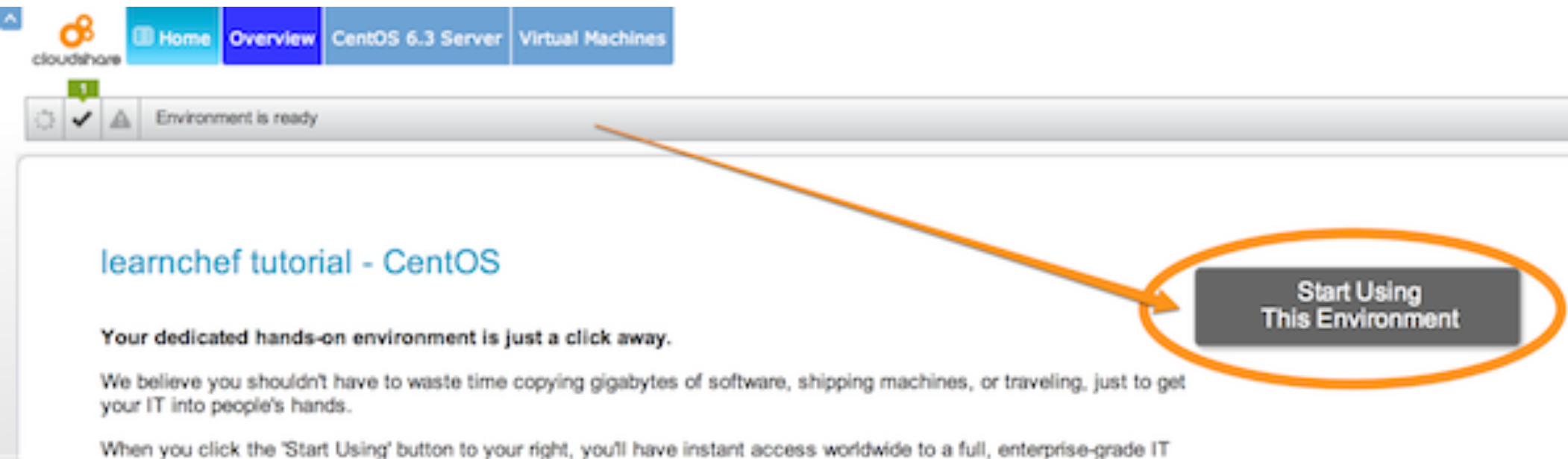
In the last module

- Refactored our apache cookbook to include multiple sites

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 'uvolqrwls0jdgs3blvt.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 'uvolqrwls0jdgs3blvt.vm.cld.sr,
69.195.232.110' (RSA) to the list of known hosts.
chef@uvolqrwls0jdgs3blvt.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 ~]$
```

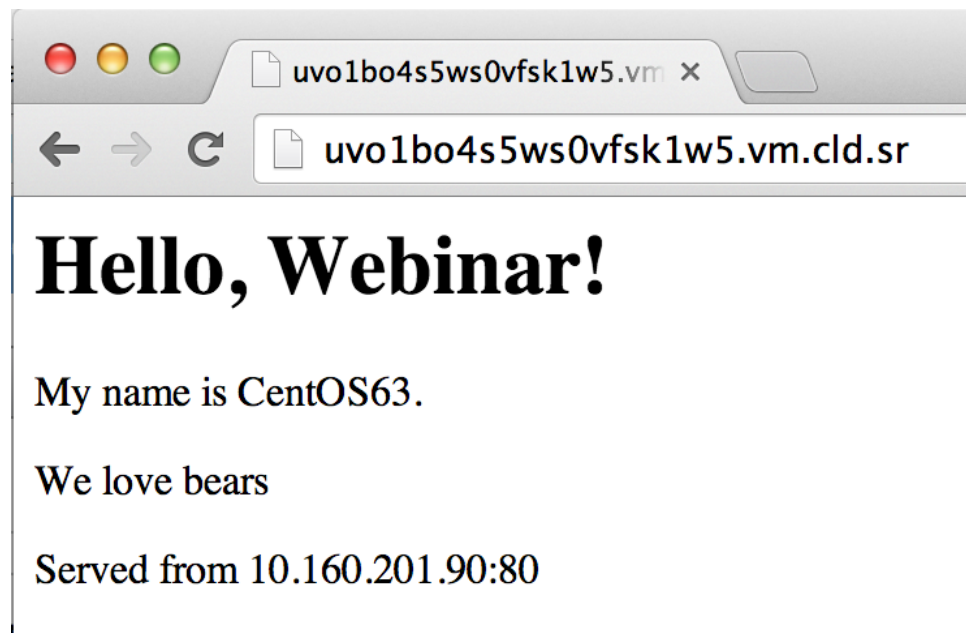
"Bootstrap" the Target Instance

```
$ knife bootstrap <EXTERNAL_ADDRESS> -x root -P chef -N 'module5' -r 'role[webserver]'
```

```
Bootstrapping Chef on uvolqrwls0jdgs3blvt.vm.cld.sr
...
...
uvolqrwls0jdgs3blvt.vm.cld.sr Creating a new client identity for
module3 using the validator key.
uvolqrwls0jdgs3blvt.vm.cld.sr resolving cookbooks for run list: []
uvolqrwls0jdgs3blvt.vm.cld.sr Synchronizing Cookbooks:
uvolqrwls0jdgs3blvt.vm.cld.sr Compiling Cookbooks...
uvolqrwls0jdgs3blvt.vm.cld.sr [2014-01-28T11:03:14-05:00] WARN: Node
module3 has an empty run list.
uvolqrwls0jdgs3blvt.vm.cld.sr Converging 0 resources
uvolqrwls0jdgs3blvt.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



Environments

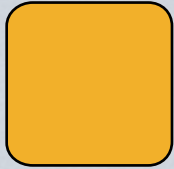
Cookbook Version Constraints and Override Attributes

Lesson Objectives

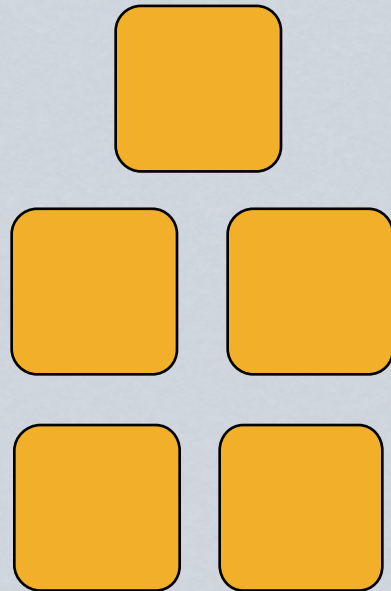
- After completing the lesson, you will be able to
 - Describe what an Environment is, and how it is different from an Organization
 - Set cookbook version constraints
 - Explain when to set attributes in an environment

Environments

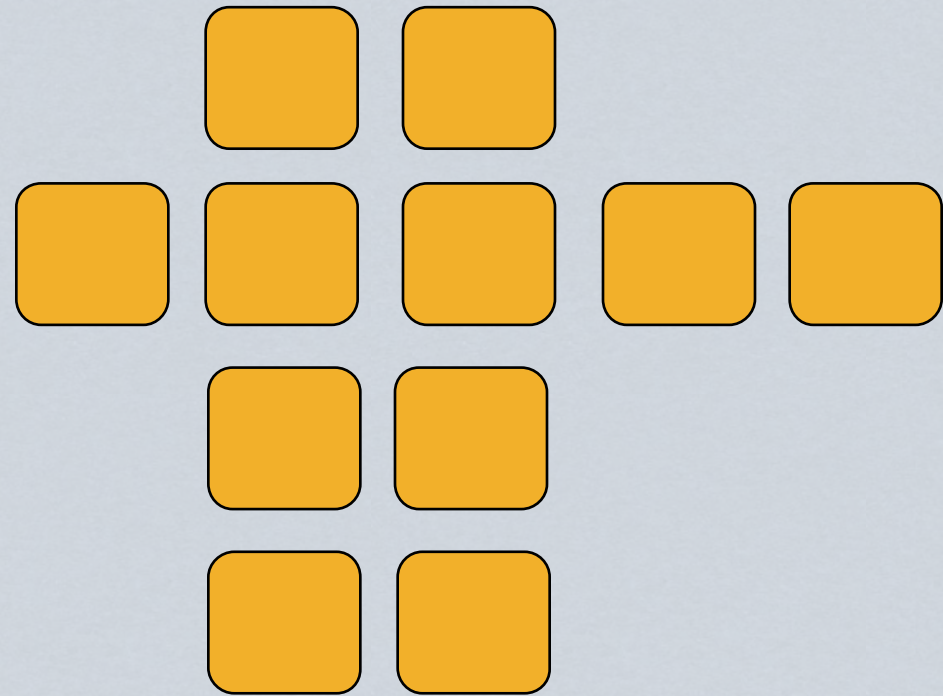
Development



Staging



Production



Organization

Environments

- Every Organization starts with a single environment
- Environments reflect your patterns and workflow
 - Development
 - Test
 - Staging
 - Production
 - etc.

Environments Define Policy

- Each environment may include attributes necessary for configuring the infrastructure in that environment
 - Production needs certain Yum repos
 - QA needs different Yum repos
 - The version of the Chef cookbooks to be used

Environment Best Practice

- We cannot share cookbooks between organizations
- Best Practice: If you need to share cookbooks or roles, you likely want an Environment rather than an organization
- Environments allow for isolating resources within a single organization

Exercise: Use knife to show the available cookbook versions

```
$ knife cookbook show apache
```

```
apache    0.2.0    0.1.0
```

Exercise: List current environments

```
_default
```

- The `_default` environment is read-only, and sets no policy at all

Exercise: List current environments

```
$ knife environment list
```

```
_default
```

- The `_default` environment is read-only, and sets no policy at all

Make an environments directory

```
$ mkdir environments
```

```
(No output)
```

Exercise: Create a dev environment



OPEN IN EDITOR: environments/dev.rb

```
name "dev"  
description "For developers!"  
cookbook "apache", "= 0.2.0"
```

SAVE FILE!

- Environments have **names**
- Environments have a **description**
- Environments *can* have one or more **cookbook** constraints

Cookbook Version Constraints

- = Equal to
- There are other options but equality is the recommended practice.
- Learn more at http://docs.opscode.com/chef/essentials_cookbook_versions.html

Exercise: Create the dev environment

```
Updated Environment dev
```

Exercise: Create the dev environment

```
$ knife environment from file dev.rb
```

```
Updated Environment dev
```

Exercise: Show your dev environment

```
chef_type:          environment
cookbook_versions:
  apache:  = 0.2.0
default_attributes:
description:        For developers!
json_class:         Chef::Environment
name:               dev
override_attributes:
```

Exercise: Show your dev environment

```
$ knife environment show dev
```

```
chef_type:          environment
cookbook_versions:
  apache:  = 0.2.0
default_attributes:
description:        For developers!
json_class:         Chef::Environment
name:               dev
override_attributes:
```

Exercise: Change your node's environment to "dev"

- Click the 'Nodes' tab then select node 'module5'
- Select dev from the 'Environments' drop-down list
- Click 'Save'

The screenshot shows the Chef Manage web interface. At the top, there are navigation tabs for 'Nodes', 'Reports', 'Policy', and 'Administration'. The 'Nodes' tab is active. Below the navigation, there is a search bar and a table of nodes. The table has columns for Node Name, Platform, FQDN, IP Address, Uptime, Last Check-In, Environment, and Actions. The first row, 'node1', is highlighted in orange. Below the table, there is a section for 'Node: node1' with tabs for 'Details', 'Attributes', and 'Permissions'. The 'Details' tab is selected. In the 'Details' section, there are two cards: 'Last Check In: 10 Minutes Ago' and 'Uptime: 9 Hours'. To the right, there is a form for changing the node's environment. The 'Environment' dropdown is set to 'dev'. A yellow message box says 'Node environment changed from _default to dev'. Below the message box are 'Cancel' and 'Save' buttons. The 'Save' button is highlighted in orange. Below the message box, there are fields for 'Platforms: centos', 'FQDN: centos63.example.com', and 'IP Address: 10.160.201.90'.

Node Name	Platform	FQDN	IP Address	Uptime	Last Check-In	Environment	Actions
node1	centos	centos63.example.com	10.160.201.90	9 hours	10 minutes ago	_default	

Node: node1

Details | Attributes | Permissions

Last Check In: **10 Minutes Ago**
2014-01-07 13:20:20 UTC

Uptime: **9 Hours**
Since 2014-01-07 04:44:01 UTC

Environment: dev

Node environment changed from **_default** to **dev**.

Cancel Save

Platforms: centos
FQDN: centos63.example.com
IP Address: 10.160.201.90

Exercise: Re-run the Chef Client


```
INFO: Chef Run complete in 1.587776095 seconds  
INFO: Running report handlers  
INFO: Report handlers complete
```

Exercise: Re-run the Chef Client

```
chef@module5$ sudo chef-client
```

```
INFO: Chef Run complete in 1.587776095 seconds  
INFO: Running report handlers  
INFO: Report handlers complete
```


Exercise: Create a production environment

 **OPEN IN EDITOR:** `environments/production.rb`

- Make sure the apache cookbook is set to version 0.1.0

```
name "production"  
description "For Production!"  
cookbook "apache", "= 0.1.0"
```

SAVE FILE!

Exercise: Create the production environment

Updated Environment production

Exercise: Create the production environment

```
$ knife environment from file production.rb
```

```
Updated Environment production
```

Exercise: Change your node's environment to "production"

- Click the 'Nodes' tab then select node 'module5'
- Select `production` from the 'Environments' drop-down list
- Click 'Save'

The screenshot shows the Chef Manage web interface. At the top, there are navigation tabs for 'Nodes', 'Reports', 'Policy', and 'Administration'. The 'Nodes' tab is active. On the left, a sidebar menu lists actions for a selected node: 'Delete', 'Manage Tags', 'Reset Key', 'Edit Run List', and 'Edit Attributes'. The main content area displays a table of nodes. The first row, 'node1', is highlighted in orange and has a gear icon in the 'Actions' column. Below the table, the 'Node: node1' details are shown, with tabs for 'Details', 'Attributes', and 'Permissions'. The 'Details' tab is active, showing 'Last Check In: 4 Minutes Ago' and 'Uptime: 9 Hours'. A yellow notification box is present, stating 'Node environment changed from dev to production', with 'Cancel' and 'Save' buttons. The 'Environment' dropdown menu is set to 'production' and is circled in orange. Below the notification, the node's metadata is listed: Platform: centos, FQDN: centos63.example.com, and IP Address: 10.160.201.90.

Node Name	Platform	FQDN	IP Address	Uptime	Last Check-In	Environment	Actions
node1	centos	centos63.example.com	10.160.201.90	9 hours	4 minutes ago	dev	

Node: node1

Details | Attributes | Permissions

Last Check In: **4 Minutes Ago**
2014-01-07 13:32:58 UTC

Uptime: **9 Hours**
Since 2014-01-07 04:38:23 UTC

Environment: **production**

Node environment changed from dev to production .
Cancel Save

Platforms: centos
FQDN: centos63.example.com
IP Address: 10.160.201.90

Exercise: Re-run the Chef Client

```
INFO: Loading cookbooks [apache, motd, pci, users]
Synchronizing Cookbooks:
```

```
...
```

```
Recipe: motd::default
```

```
  * template[/etc/motd] action create[2014-01-07T08:40:00-05:00] INFO: Processing template[/etc/motd] action create
    (motd::default line 9)
```

```
[2014-01-07T08:40:00-05:00] INFO: template[/etc/motd] backed up to /var/chef/backup/etc/motd.chef-20140107084000.070961
```

```
[2014-01-07T08:40:00-05:00] INFO: template[/etc/motd] updated file contents /etc/motd
```

```
  - update content in file /etc/motd from d36elf to 62ebb9
    (current file is binary, diff output suppressed)
```

```
...
```

```
  * cookbook_file[/var/www/index.html] action create[2014-01-07T08:40:05-05:00] INFO: Processing cookbook_file[/var/
    www/index.html] action create (apache::default line 18)
    (up to date)
```

```
[2014-01-07T08:40:06-05:00] INFO: Chef Run complete in 8.048307322 seconds
```

```
[2014-01-07T08:40:06-05:00] INFO: Removing cookbooks/apache/templates/default/index.html.erb from the cache; it is no
longer needed by chef-client.
```

```
[2014-01-07T08:40:06-05:00] INFO: Removing cookbooks/apache/templates/default/custom.erb from the cache; it is no
longer needed by chef-client
```

Exercise: Re-run the Chef Client

```
chef@module5$ sudo chef-client
```

```
INFO: Loading cookbooks [apache, motd, pci, users]
Synchronizing Cookbooks:
```

```
...
```

```
Recipe: motd::default
```

```
  * template[/etc/motd] action create[2014-01-07T08:40:00-05:00] INFO: Processing template[/etc/motd] action create
(motd::default line 9)
```

```
[2014-01-07T08:40:00-05:00] INFO: template[/etc/motd] backed up to /var/chef/backup/etc/motd.chef-20140107084000.070961
```

```
[2014-01-07T08:40:00-05:00] INFO: template[/etc/motd] updated file contents /etc/motd
```

```
  - update content in file /etc/motd from d36elf to 62ebb9
    (current file is binary, diff output suppressed)
```

```
...
```

```
  * cookbook_file[/var/www/index.html] action create[2014-01-07T08:40:05-05:00] INFO: Processing cookbook_file[/var/
www/index.html] action create (apache::default line 18)
```

```
(up to date)
```

```
[2014-01-07T08:40:06-05:00] INFO: Chef Run complete in 8.048307322 seconds
```

```
[2014-01-07T08:40:06-05:00] INFO: Removing cookbooks/apache/templates/default/index.html.erb from the cache; it is no
longer needed by chef-client.
```

```
[2014-01-07T08:40:06-05:00] INFO: Removing cookbooks/apache/templates/default/custom.erb from the cache; it is no
longer needed by chef-client
```

Rollbacks and Desired State Best Practice

- Chef is not magic - it manages state for **declared** resources
- We just rolled back to an earlier version of the apache cookbook
- While the recipe applied fine, investigating the system will reveal Apache is still configured as it was in the 0.2.0 cookbook

Chef Fundamentals Webinar Series

Six Week Series

- Module 1 - Overview of Chef
 - Module 2 - Node Setup, Chef Resources & Recipes
 - Module 3 - Working with the Node object & Roles
 - June 10 - Common configuration data with Databags
 - Today - 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=S5IHUpzoCYo&list=PL11cZfNdwNyPnZA9D1MbVqldGuOWqbumZ>
- 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>