The Chef Server

A Hub for Configuration Data

©2017 Chef Software Inc.

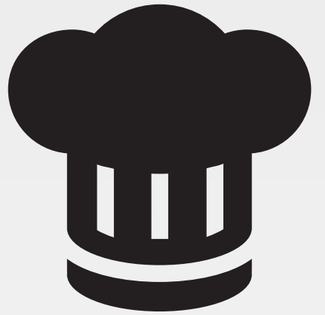
CHEF

Objectives

After completing this module, you should be able to

- Connect your local workstation (laptop) to a Chef Server
- Upload cookbooks to a Chef Server
- Bootstrap a node
- Manage a node via a Chef Server

©2017 Chef Software Inc.



More Web Servers?

More easily manage multiple nodes

Objective:

- ❑ Create a Hosted Chef Account
- ❑ Upload your cookbooks to the Hosted Chef Server
- ❑ Add a new node as a managed node

©2017 Chef Software Inc.

CHEF

Managing an Additional System

To manage another system, you would need to:

1. Provision a new node within your company or appropriate cloud provider with the appropriate access to login to administrate the system.
2. Install the Chef tools.
3. Transfer the apache cookbook.
4. Run chef-client on the new node to apply the apache cookbook's default recipe.

©2017 Chef Software Inc.

Managing Additional Systems

Installing the Chef tools, transferring the apache cookbook, and applying the run list is not terribly expensive.

- Chef provides a one-line curl install.
- You could use **git** to clone the repository from a common **git** repository.
- Applying the run list.

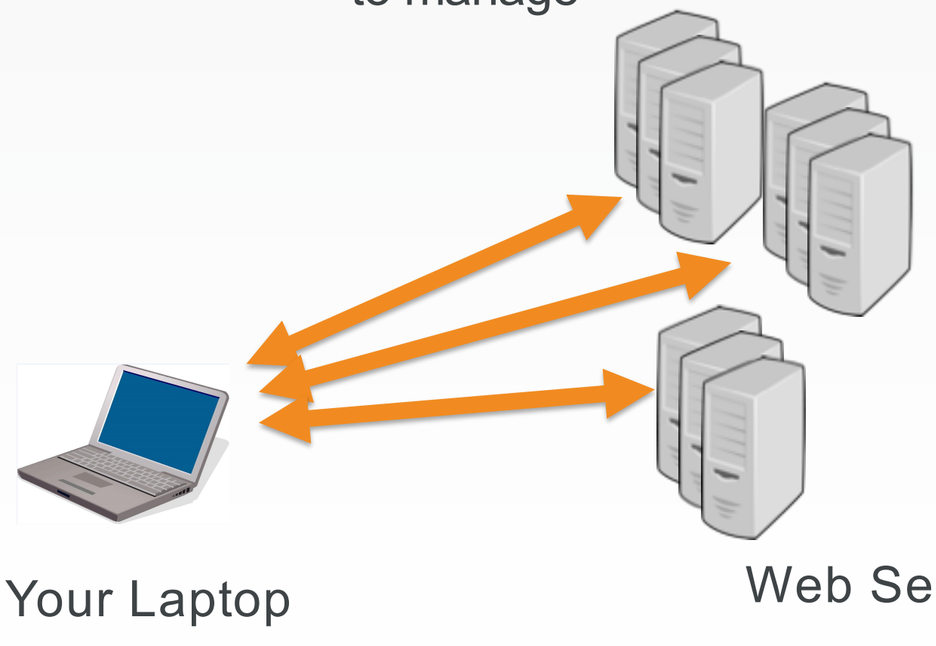
©2017 Chef Software Inc.

Managing Additional Systems

Now

Future

More complex
to manage

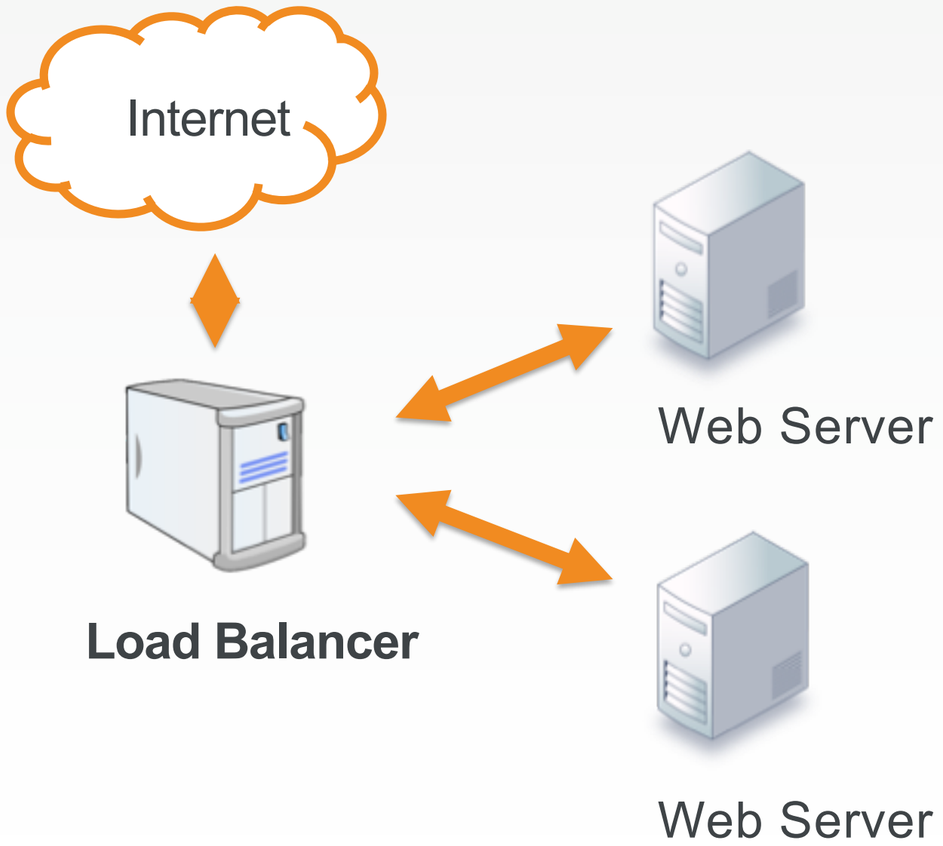


©2017 Chef Software Inc.

CHEF

Managing User Traffic

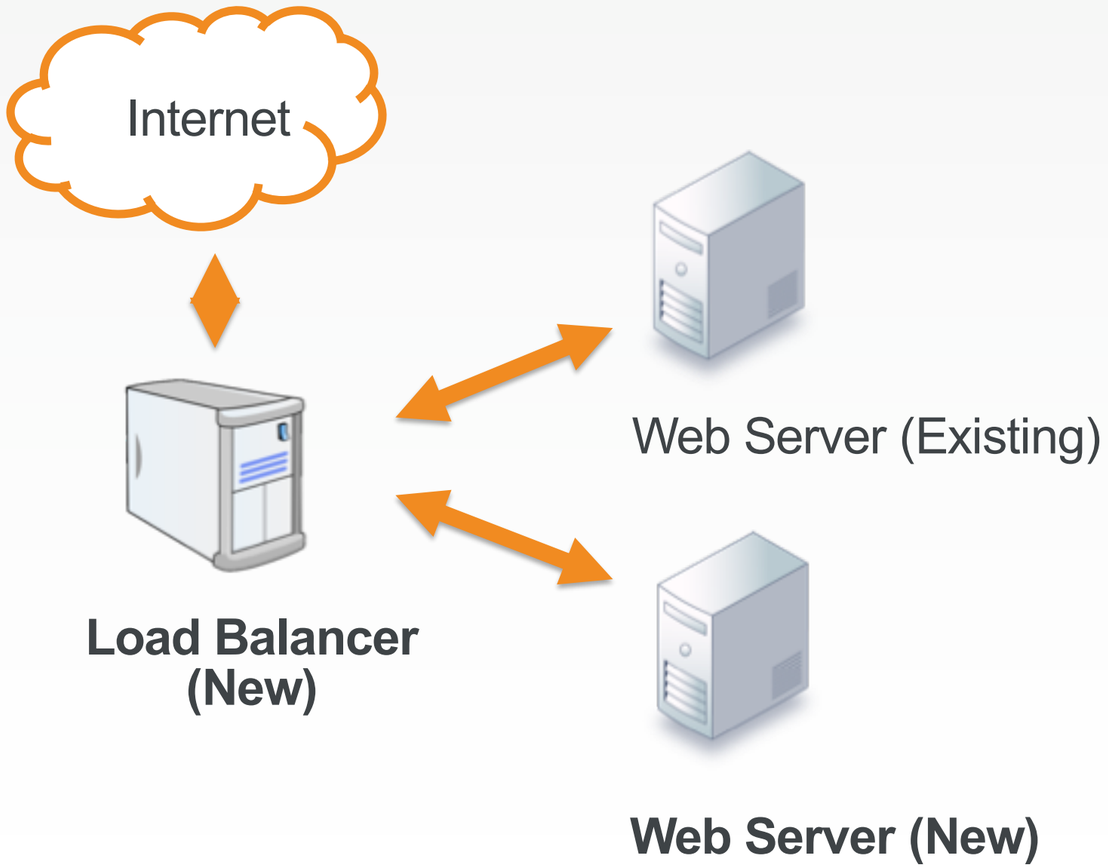
A load balancer can forward incoming user web requests to other nodes.



©2017 Chef Software Inc.

Managing User Traffic

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



©2017 Chef Software Inc.

Steps to Set up Load Balancer and Web Servers

Web Server

1. Provision the instance
2. Install Chef
3. Copy the Web Server cookbook
4. Apply the cookbook

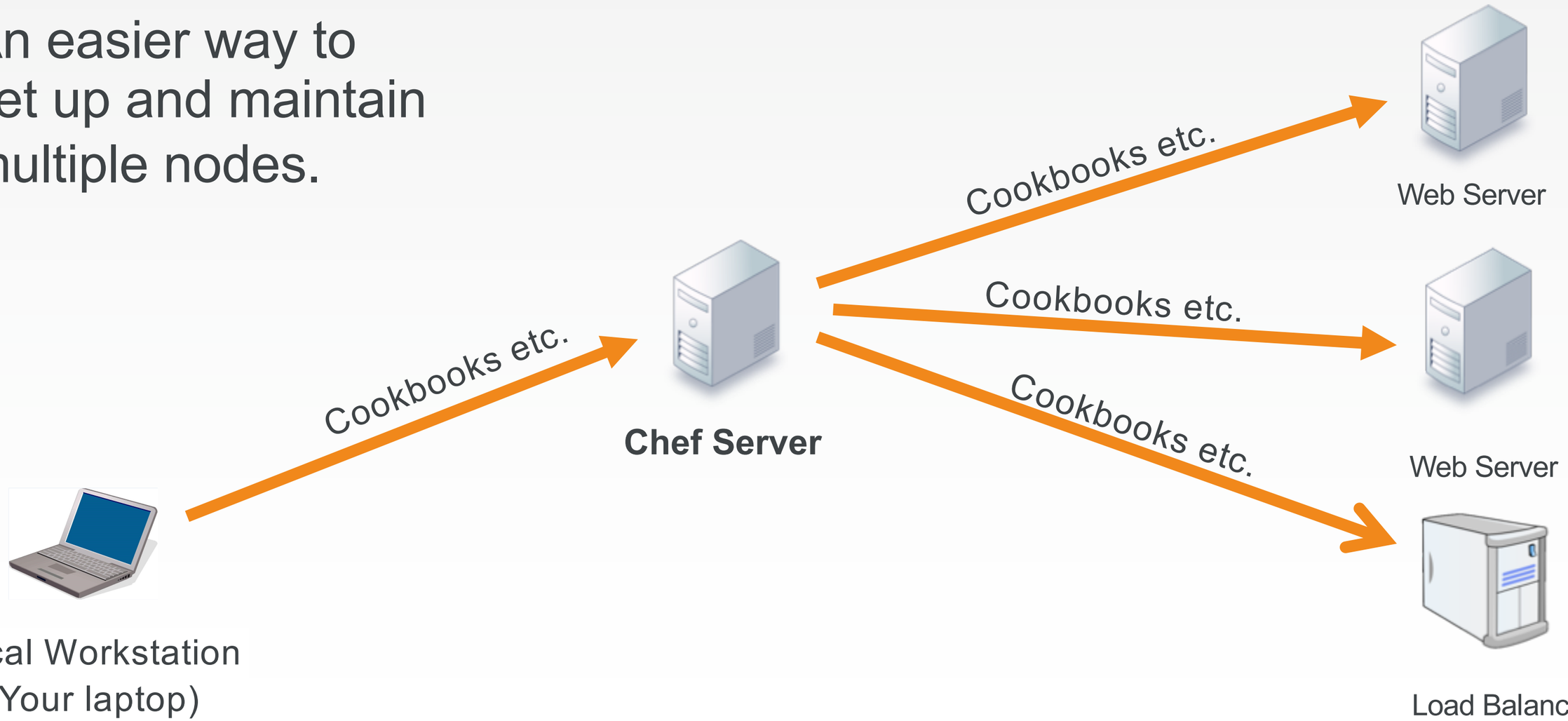
Load Balancer

1. Create the haproxy (load balancer) cookbook
2. Provision the instance
3. Install Chef
4. Copy the haproxy cookbook
5. Apply the cookbook

©2017 Chef Software Inc.

The Chef Server

An easier way to set up and maintain multiple nodes.

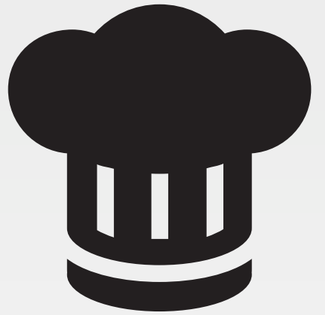


©2017 Chef Software Inc.

Flavors of Chef Server

Open Source		Multi-tenant
Chef Server	**Chef Server** (Support + Premium Features)	**Hosted Chef Server**

©2017 Chef Software Inc.



GL: Hosted Chef

More easily manage multiple nodes

Objective:

- ❑ Create a Hosted Chef Account
- ❑ Upload your cookbooks to the Hosted Chef Server
- ❑ Add a new node as a managed node

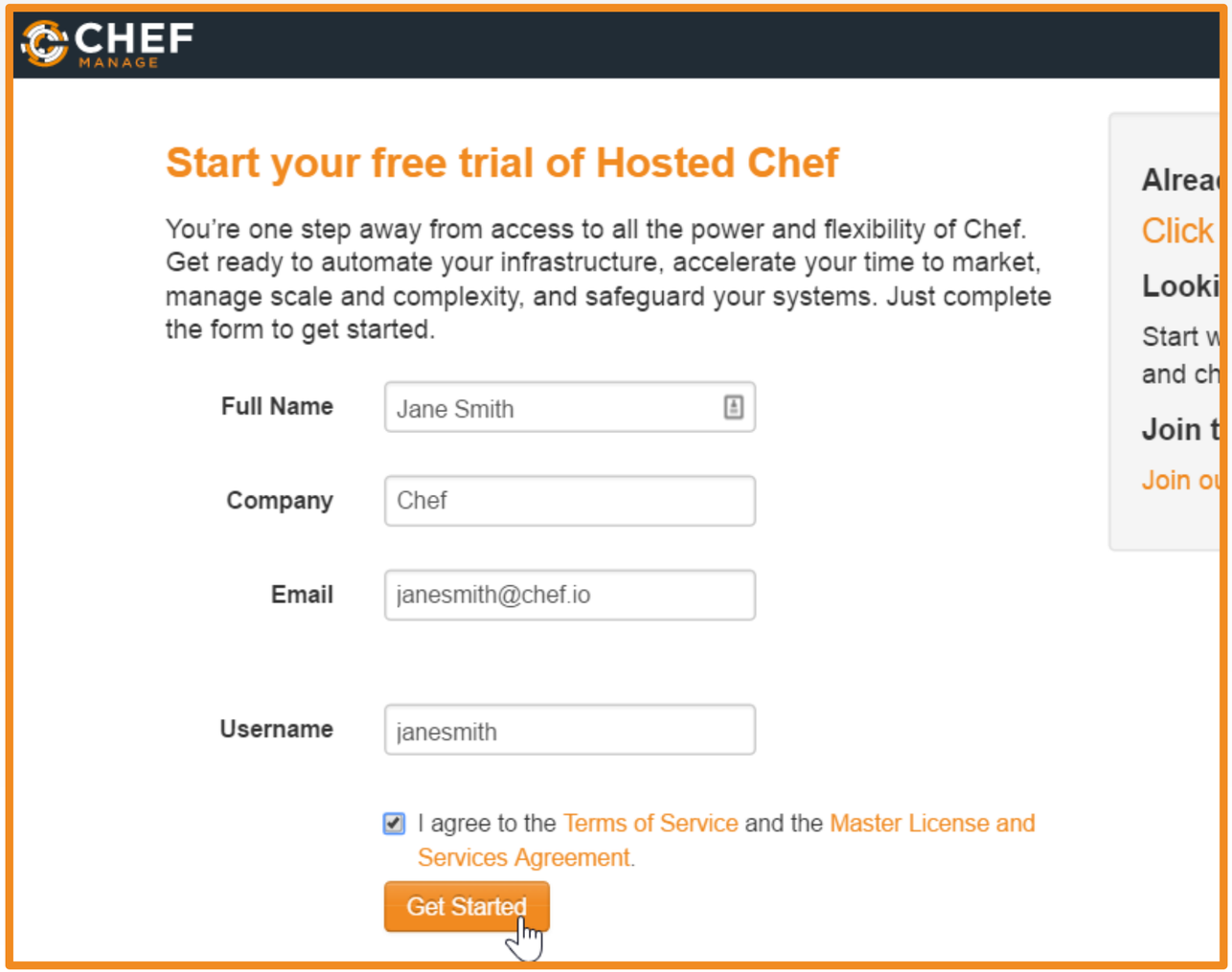
©2017 Chef Software Inc.

GL: Signing Up for a Hosted Chef Account

Steps

1. Navigate to https://manage.chef.io/signup

2. Fill out the form as indicated in this image using your name and a valid email address and then click **Get Started**.

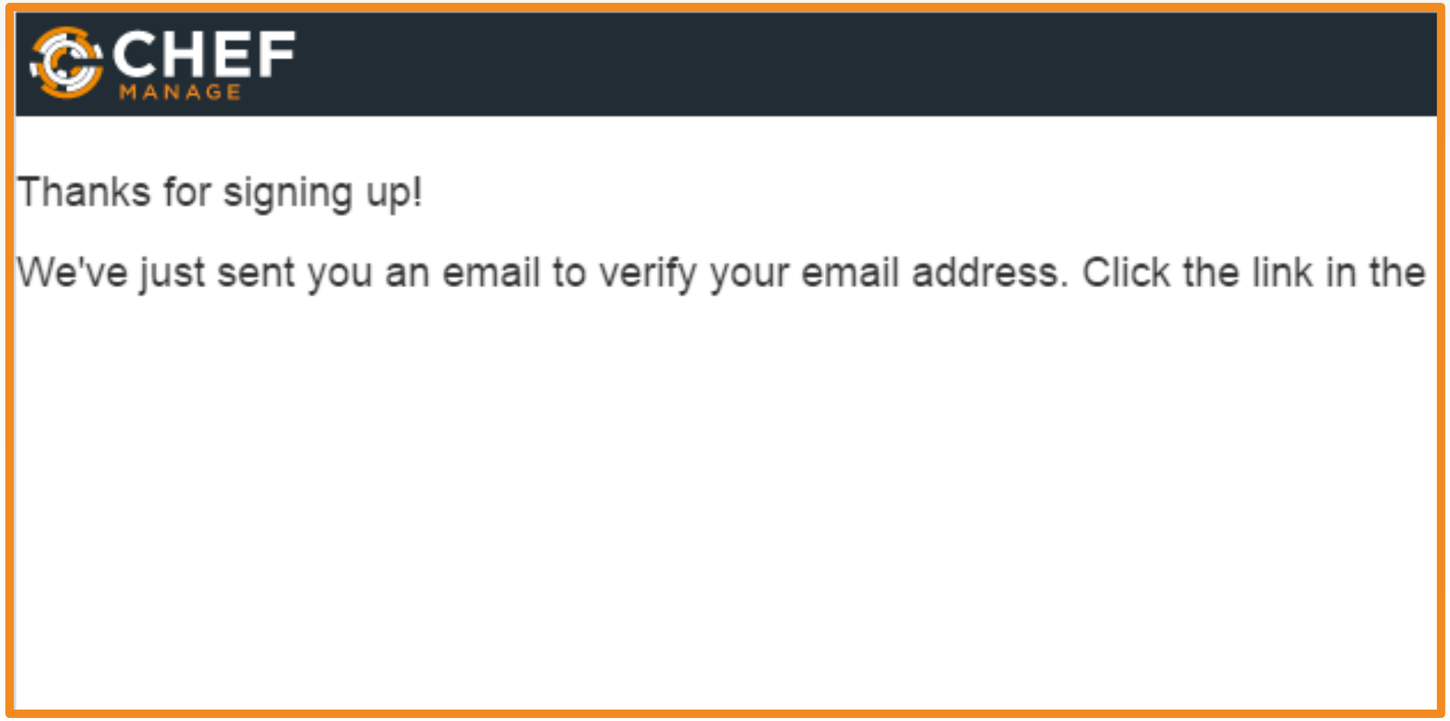


©2017 Chef Software Inc.

GL: Signing Up for a Hosted Chef Account

Steps

3. When prompted, open the email just sent to you and click the link in the email to finish the creation of your account.



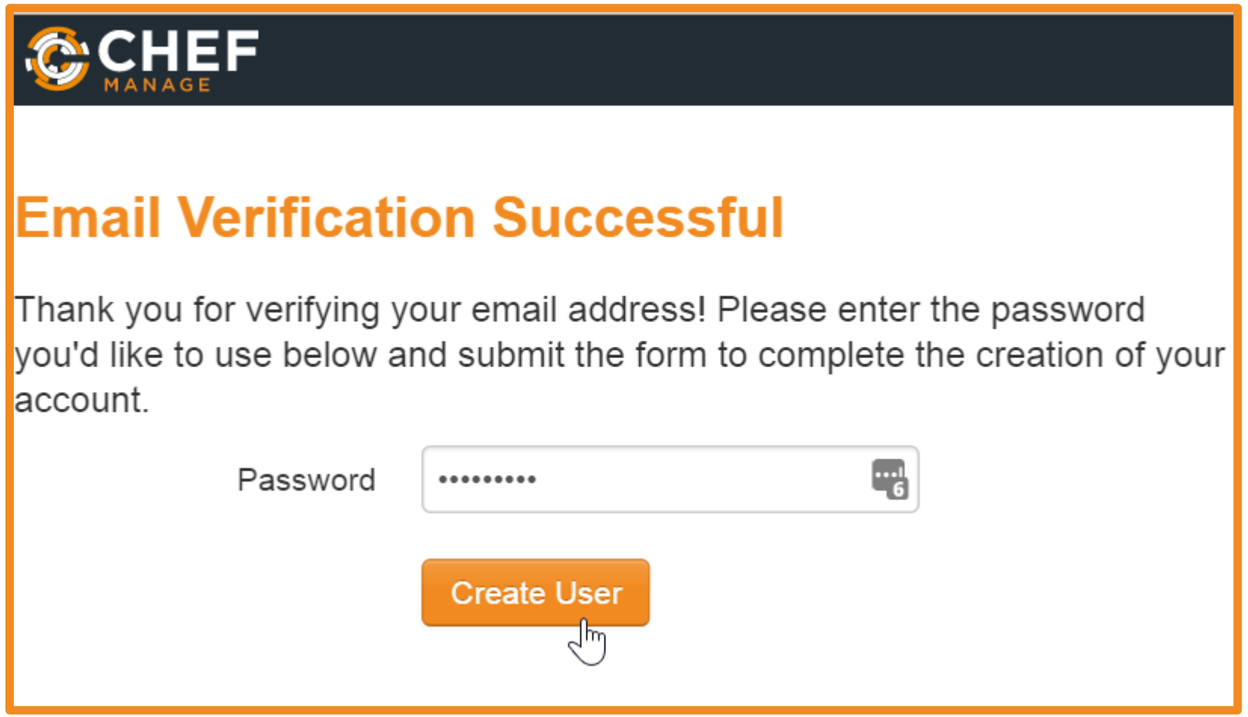
©2017 Chef Software Inc.

GL: Signing Up for a Hosted Chef Account

Steps

4. Enter a password when prompted and then click **Create User**.

   You should write down your password in case you forget it.



©2017 Chef Software Inc.

CHEF

GL: Signing Up for a Hosted Chef Account

Steps

5. From the resulting page, click the **Create New Organization** button.

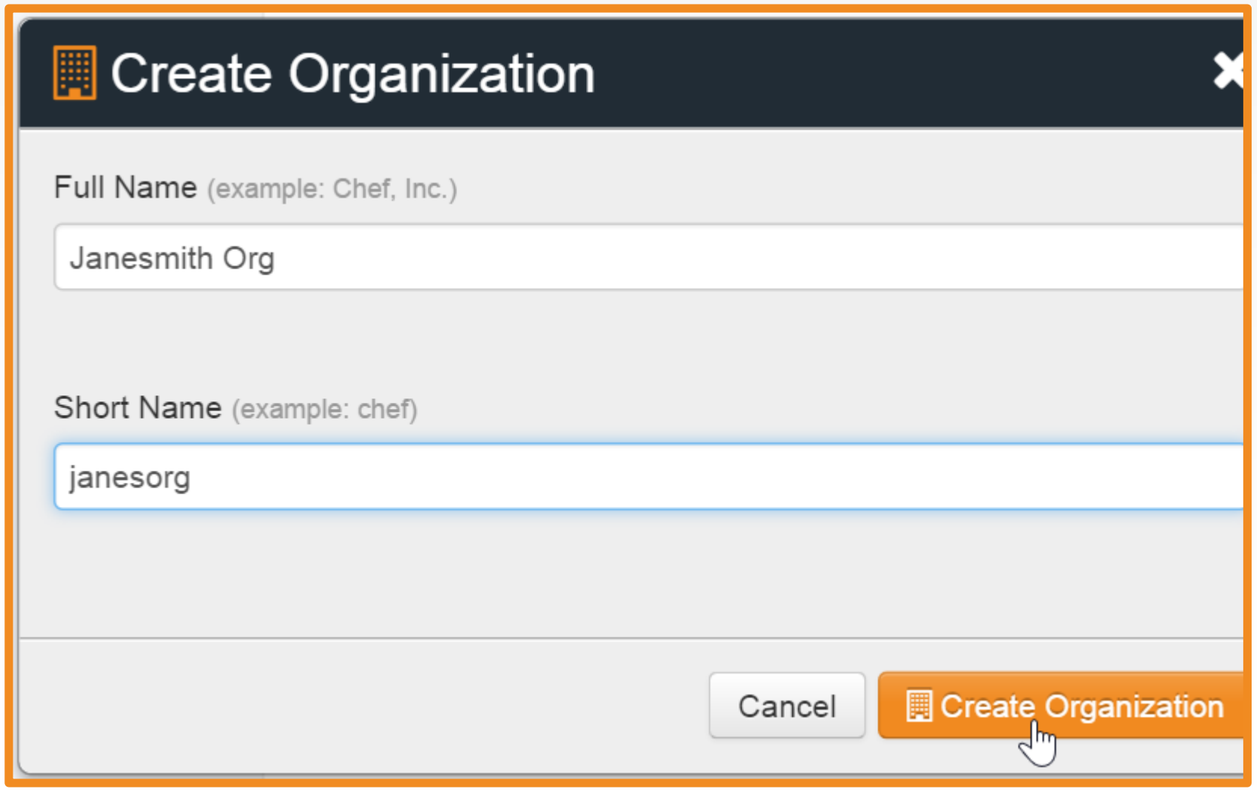
©2017 Chef Software Inc.

CHEF

GL: Signing Up for a Hosted Chef Account

Steps

6. Fill out the resulting Create Organization form and then click **Create Organization**.



©2017 Chef Software Inc.

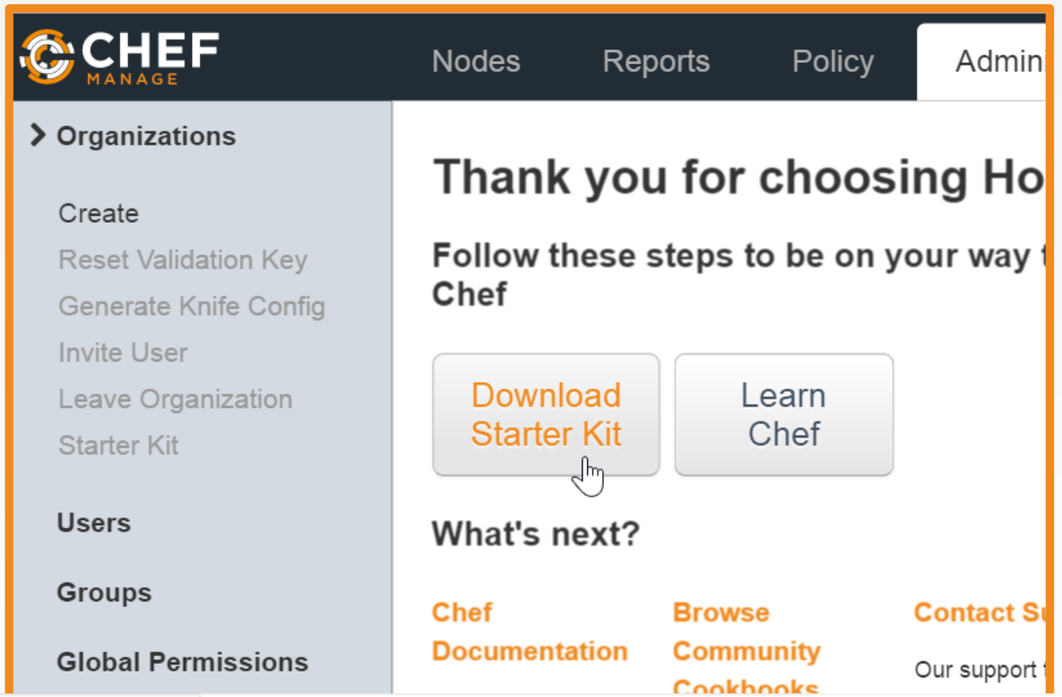
CHEF

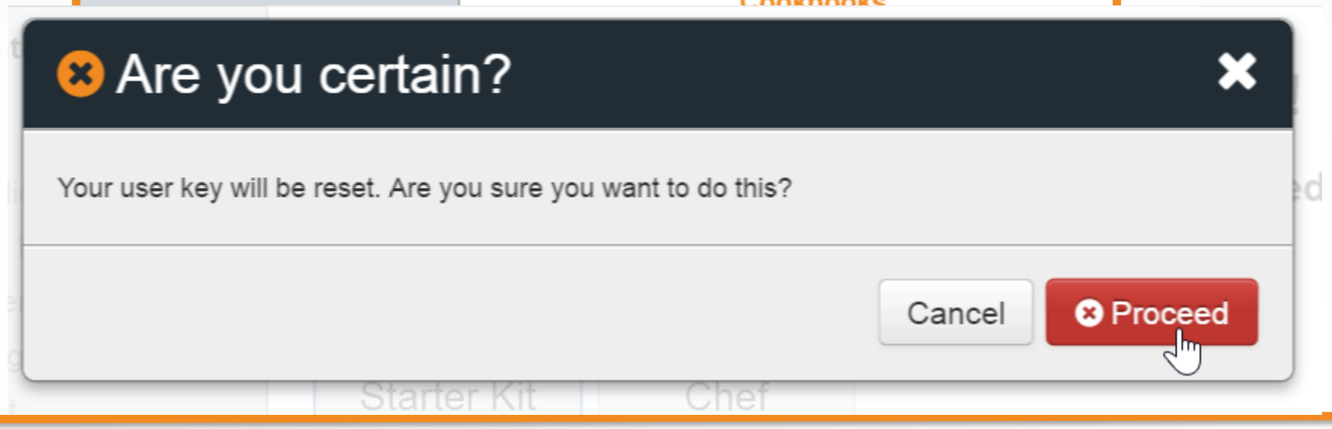
GL: Signing Up for a Hosted Chef Account

Steps

7. From the resulting page, click **Download Starter Kit** and then click **Proceed** when prompted.

A chef-starter zip file should download to your laptop.





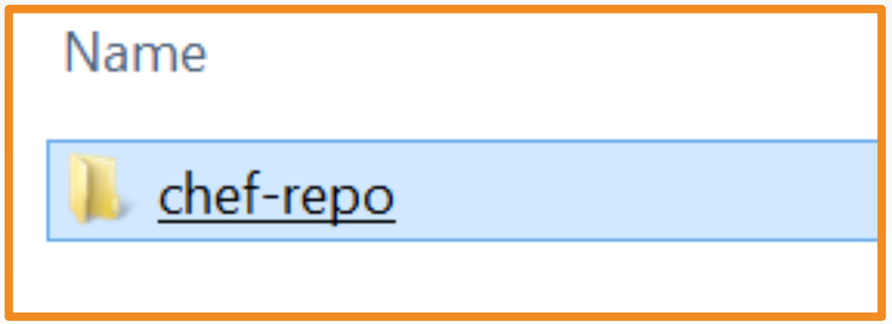
©2017 Chef Software Inc.

CHEF

GL: Signing Up for a Hosted Chef Account

Steps

8. Open the downloaded zip file and copy chef-repo folder that's contained in the zip file.
9. Paste the chef-repo folder to a location on your laptop, such as your home directory.



Note: Ensure that the path to the chef-repo does not have a space in it. Examples:

Windows: C:\Users\chef\cookbooks\chef-repo

©2017 Chef Software Inc.

GL: Download a Repository

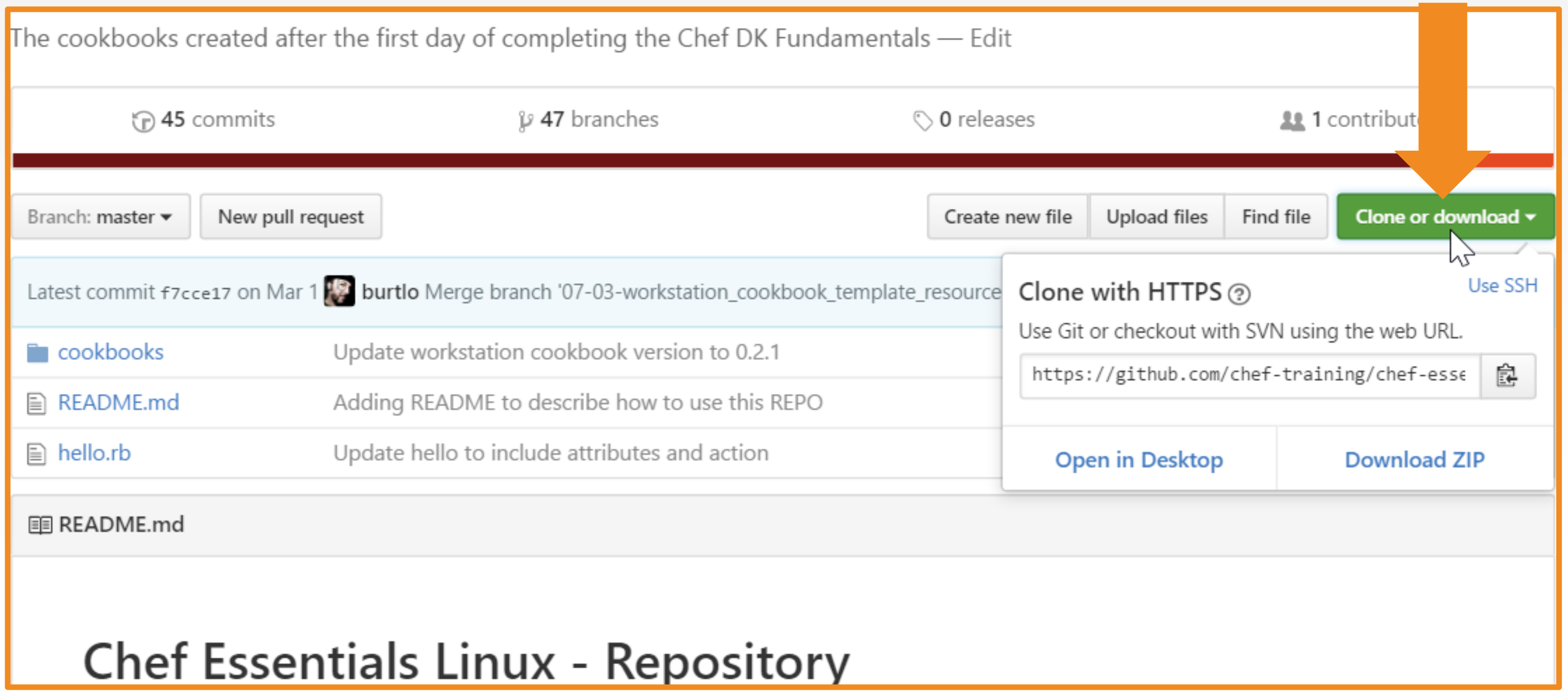
A repository containing a similar copy of the work you did previously in this course can be downloaded from here:

https://github.com/chef-training/chef-essentials-repo

©2017 Chef Software Inc.

CHEF

GL: Download the Repository



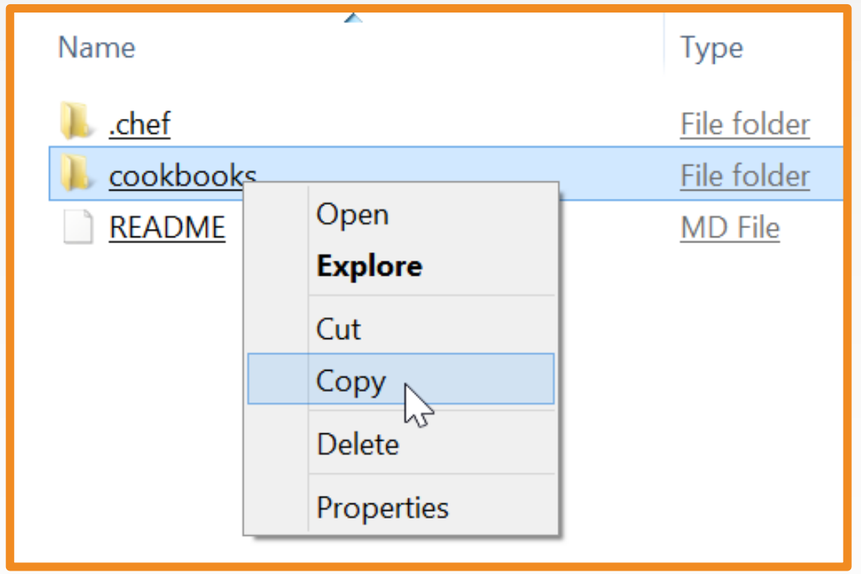
©2017 Chef Software Inc.

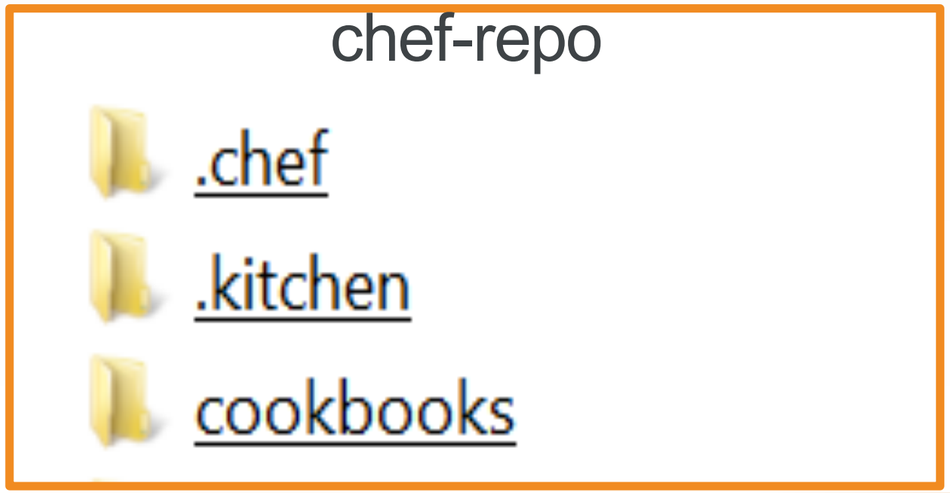
CHEF

GL: Paste the cookbooks Folder

Steps

- Open the downloaded chefdk-fundamentals-repo-master zip file and then copy **only** the **cookbooks** folder that's contained in the zip file.
- Replace the **cookbooks** folder that's in your chef-repo folder with the copied cookbooks folder.





©2017 Chef Software Inc.

GL: Navigate to the chef-repo

```
$ cd ~/chef-repo
```

©2017 Chef Software Inc.

CONCEPT

knife

knife is a command-line tool that provides an interface between a local chef-repo and the Chef Server.

©2017 Chef Software Inc.

CHEF

GL: knife --help

```
$ knife --help
```

```
Available subcommands: (for details, knife SUB-COMMAND --help)

** BOOTSTRAP COMMANDS **
knife bootstrap FQDN (options)
knife bootstrap windows ssh FQDN (options)
knife bootstrap windows winrm FQDN (options)

** CLIENT COMMANDS **
knife client bulk delete REGEX (options)
knife client create CLIENT (options)
knife client delete CLIENT (options)
knife client edit CLIENT (options)
```

©2017 Chef Software Inc.

GL: knife client --help

```
$ knife client --help
```

```
Available client subcommands: (for details, knife SUB-COMMAND --help)

** CLIENT COMMANDS **
knife client bulk delete REGEX (options)
knife client create CLIENT (options)
knife client delete CLIENT (options)
knife client edit CLIENT (options)
knife client list (options)
knife client reregister CLIENT (options)
knife client show CLIENT (options)
```

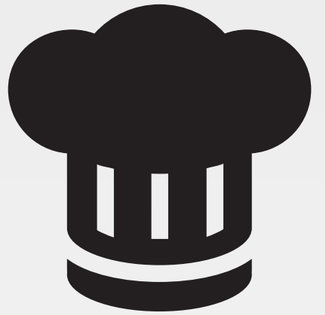
©2017 Chef Software Inc.

GL: knife client list

```
$ knife client list
```

```
ORGNAME-validator
```

©2017 Chef Software Inc.



Hosted Chef

More easily manage multiple nodes

Objective:

- ✓ Create a Hosted Chef Account
- ❑ Upload your cookbooks to the Hosted Chef Server
- ❑ Add a new node as a managed node

©2017 Chef Software Inc.

GL: knife cookbook --help

```
$ knife cookbook --help
```

```
** COOKBOOK COMMANDS **
knife cookbook bulk delete REGEX (options)
knife cookbook create COOKBOOK (options)
knife cookbook delete COOKBOOK VERSION (options)
knife cookbook download COOKBOOK [VERSION] (options)
knife cookbook list (options)
knife cookbook metadata COOKBOOK (options)
knife cookbook metadata from FILE (options)
knife cookbook show COOKBOOK [VERSION] [PART] [FILENAME] (options)
knife cookbook test [COOKBOOKS...] (options)
knife cookbook upload [COOKBOOKS...] (options)
```

©2017 Chef Software Inc.

CHEF

GL: knife cookbook list

```
$ knife cookbook list
```

LOCAL

©2017 Chef Software Inc.

CHEF

CONCEPT

Berkshelf

Berkshelf is a cookbook management tool that allows us to upload your cookbooks and all of its dependencies to the Chef Server.

http://berkshelf.com

LOCAL

©2017 Chef Software Inc.

CHEF

GL: Run berks --help

```
$ berks --help
```

```
Commands:
  berks apply ENVIRONMENT     # Apply version locks from Berksfile.lock to a ...
  berks contingent COOKBOOK   # List all cookbooks that depend on the given c...
  berks cookbook NAME [PATH]  # Create a skeleton for a new cookbook
  berks help [COMMAND]        # Describe available commands or one specific c...
  berks info [COOKBOOK]       # Display name, author, copyright, and dependen...
  berks init [PATH]           # Initialize Berkshelf in the given directory
  berks install               # Install the cookbooks specified in the Berksfile
  berks list                  # List cookbooks and their dependencies specifi...
  berks outdated [COOKBOOKS]  # List dependencies that have new versions avai...
  berks package [PATH]        # Vendor and archive the dependencies of a Berk...
  berks search NAME           # Search the remote source for cookbooks matchi...
  berks shelf SUBCOMMAND      # Interact with the cookbook store
  berks show [COOKBOOK]       # Display the path to a cookbook on disk
```

©2017 Chef Software Inc.

CHEF

GL: Change to the cookbooks/apache Directory

```
$ cd cookbooks/apache
```

To upload a cookbook to the Chef Server you need to be within the directory of the cookbook.

©2017 Chef Software Inc.

GL: Run berks install

```
$ berks install
```

```
Resolving cookbook dependencies...
Fetching 'apache' from source at .
Fetching cookbook index from https://supermarket.chef.io...
Using apache (0.2.1) from source at .
```

LOCAL

©2017 Chef Software Inc.

CHEF

GL: See the Berksfile.lock

```
$ ls -al (or ls -Force if using Powershell)
```

```
drwxr-xr-x 7 chef chef 4096 Aug 27 18:44 .
drwxr-xr-x 4 chef chef 4096 Aug 27 16:17 ..
drwxr-xr-x 8 chef chef 4096 Aug 27 16:07 .git
-rw-r--r-- 1 chef chef  126 Aug 27 15:46 .gitignore
drwxr-xr-x 3 chef chef 4096 Aug 27 18:45 .kitchen
-rw-r--r-- 1 chef chef  183 Aug 27 18:44 .kitchen.yml
-rw-r--r-- 1 chef chef   47 Aug 27 15:46 Berksfile
-rw------- 1 chef chef   77 Aug 27 18:45 Berksfile.lock
-rw-r--r-- 1 chef chef   54 Aug 27 15:46 README.md
-rw-r--r-- 1 chef chef  974 Aug 27 15:46 chefignore
-rw-r--r-- 1 chef chef  198 Aug 27 15:46 metadata.rb
drwxr-xr-x 2 chef chef 4096 Aug 27 16:34 recipes
```

©2017 Chef Software Inc.

CHEF

GL: See the Contents of the Berksfile.lock

```
$ cat Berksfile.lock
```

```
DEPENDENCIES
  apache
    path: .
    metadata: true

GRAPH
  apache (0.2.1)
```

LOCAL

©2017 Chef Software Inc.

CHEF

GL: Upload the Cookbook to the Chef Server

```
$ berks upload
```

```
Uploaded apache (0.2.1) to: 'https://api.opscode.com:443/organizations/ORG'
```

©2017 Chef Software Inc.

CHEF

GL: Display Cookbooks within Your Org

```
$ knife cookbook list
```

```
apache          0.2.1
```

LOCAL

©2017 Chef Software Inc.

CHEF

Lab

Lab: Upload Cookbooks

- ❑ Upload your remaining cookbooks
- ❑ Verify that all cookbooks are uploaded

©2017 Chef Software Inc.

Lab: cd and Run knife cookbook list

```
$ cd ~/chef-repo/cookbooks/workstation
$ knife cookbook list
```

```
apache          0.2.1
```

©2017 Chef Software Inc.

Lab: Install the Cookbook Dependencies

```
$ berks install
```

```
Resolving cookbook dependencies...
Fetching 'workstation' from source at .
Fetching cookbook index from https://supermarket.chef.io...
Using workstation (0.2.1) from source at .
```

©2017 Chef Software Inc.

CHEF

Lab: Upload the Cookbook to the Chef Server

```
$ berks upload
```

```
Uploaded workstation (0.2.1) to:
'https://api.opscode.com:443/organizations/ORG'
```

©2017 Chef Software Inc.

Lab: Is the workstation Cookbook Uploaded?

```
$ knife cookbook list
```

```
apache          0.2.1
workstation     0.2.1
```

©2017 Chef Software Inc.

Lab

Lab: Upload Cookbooks

- ✓ Upload your remaining cookbooks
- ✓ Verify that all cookbooks are uploaded

©2017 Chef Software Inc.

Lab

Lab: Create your Nodes

- ❑ Clone the Training Node Setup
- ❑ Use Kitchen to create your 3 Nodes

©2017 Chef Software Inc.

CHEF

GL: Download a Repository

A repository containing a cookbook that will create 3 Centos Nodes for each student:

https://github.com/anthonygrees/training_node_setup

©2017 Chef Software Inc.

CHEF

Lab: Clone Training Nodes

```
$ cd ~/chef-repo/cookbooks
$ git clone
https://github.com/anthonygrees/training_node_setup
```

```
C:\Users\chef\cookbooks\chef-repo\cookbooks> git clone
https://github.com/anthonygrees/training_node_setup
Cloning into 'training_node_setup'...
remote: Counting objects: 66, done.
remote: Compressing objects: 100% (33/33), done.
remote: Total 66 (delta 18), reused 66 (delta 18), pack-reused 0
Unpacking objects: 100% (66/66), done.
```

©2017 Chef Software Inc.

CHEF

Lab: Create your Nodes

```
$ cd training_node_setup
$ kitchen create
```

```
-----> Creating <node-1-centos-6>...
       Detected platform: centos version 6 on x86_64. Instance Type: t2.micro.
Default username: centos (default).
       If you are not using an account that qualifies under the AWS
free-tier, you may be charged to run these suites. The charge
should be minimal, but neither Test Kitchen nor its maintainers
are responsible for your incurred costs.
       Instance <i-05ab4e9a2221a013f> requested.
       Polling AWS for existence, attempt 0...
```

©2017 Chef Software Inc.

CHEF

Lab: Check your IP Address

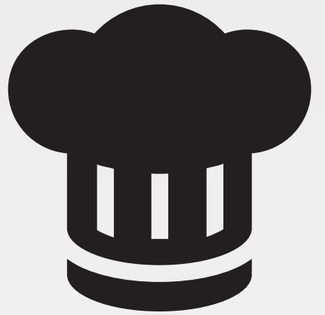
```
$ code .
```

Lab

Lab: Create your Nodes

- ✓ Clone the Training Node Setup
- ✓ Use Kitchen to create your 3 Nodes

©2017 Chef Software Inc.



Hosted Chef

More easily manage multiple nodes

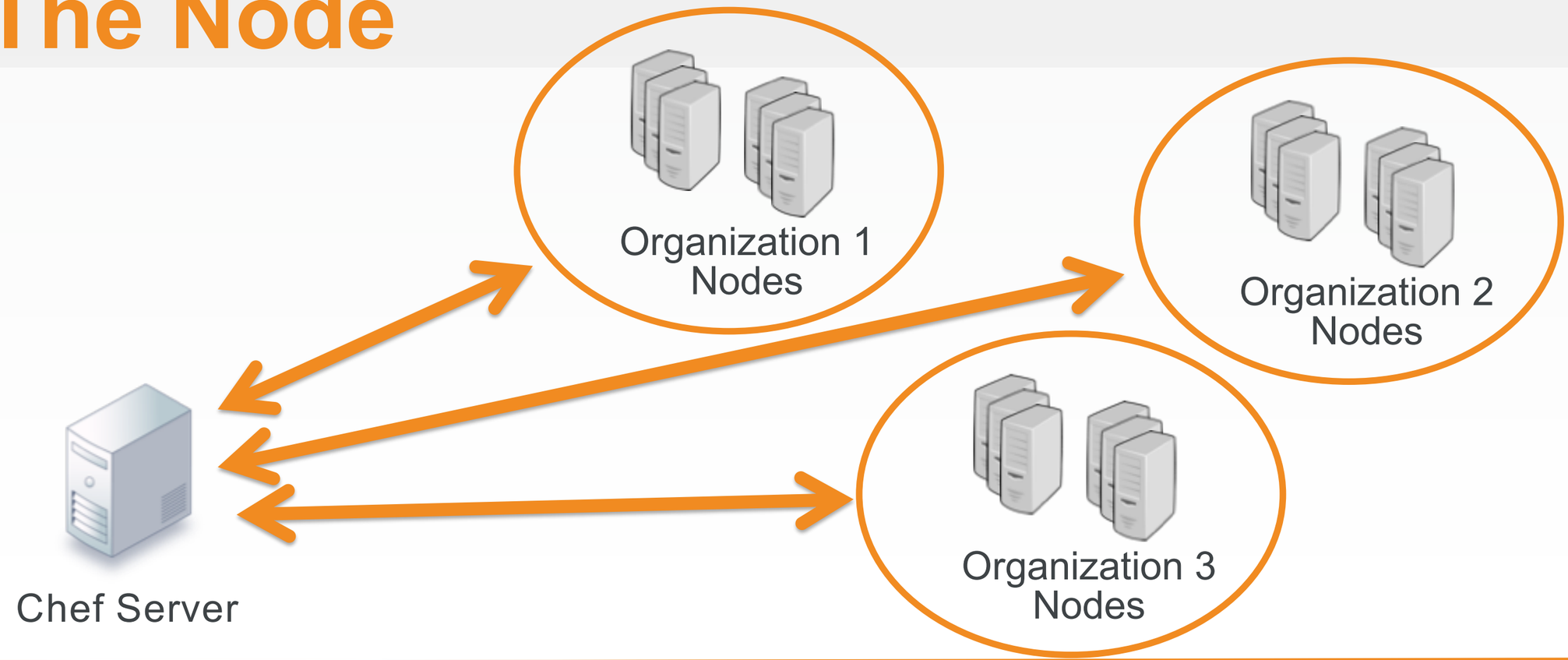
Objective:

- ✓ Create a Hosted Chef Account
- ✓ Upload your cookbooks to the Hosted Chef Server
- ❑ Add a new node as a managed node

©2017 Chef Software Inc.

CONCEPT

The Node



©2017 Chef Software Inc.

CHEF

Lab

GL: Bootstrap Your Node

In this lab you will use a new instance and bootstrap it as a managed node.

You'll need the FQDN of that instance to perform this lab.

©2017 Chef Software Inc.

CHEF

GL: Change to the chef-repo

```
$ cd ~/chef-repo
```

©2017 Chef Software Inc.

GL: Run 'knife node –help'

```
$ knife node --help
```

```
** NODE COMMANDS **
knife node bulk delete REGEX (options)
knife node create NODE (options)
knife node delete NODE (options)
knife node edit NODE (options)
knife node environment set NODE ENVIRONMENT
knife node from file FILE (options)
knife node list (options)
knife node run_list add [NODE] [ENTRY[,ENTRY]] (options)
knife node run_list remove [NODE] [ENTRY[,ENTRY]] (options)
knife node run_list set NODE ENTRIES (options)
knife node show NODE (options)
```

©2017 Chef Software Inc.

CHEF

GL: Run 'knife node list'

```
$ knife node list
```

©2017 Chef Software Inc.

CONCEPT

Bootstrapping a Node

Often, the node you are bootstrapping may not have Chef installed. It may also not have details of where the Chef Server is located or the credentials to securely talk to that Server.

To add those credentials we can **bootstrap** that node to install all those components.

https://learn.chef.io/skills/beyond-essentials-1

LOCAL

©2017 Chef Software Inc.

CHEF

GL: Run 'knife bootstrap –help'

```
$ knife bootstrap --help
```

```
knife bootstrap FQDN (options)
        --bootstrap-curl-options OPTIONS
                                     Add options to curl when install chef-client
        --bootstrap-install-command COMMANDS
                                     Custom command to install chef-client
        --bootstrap-no-proxy [NO_PROXY_URL|NO_PROXY_IP]
                                     Do not proxy locations for the node being
bootstrapped; this option is used interna
lly by Opscode
        --bootstrap-proxy PROXY_URL  The proxy server for the node being
bootstrapped
    -t TEMPLATE,                     Bootstrap Chef using a built-in or custom
template. Set to the full path of an erb
template or use one of the built-in templates.
```

©2017 Chef Software Inc.

CHEF

GL: Bootstrap Your Node

```
$ knife bootstrap FQDN -x USER -P PWD --sudo -N node1
```

```
Creating new client for node1
Creating new node for node1
C                    6-24.compute-1.amazonaws.com
e                    .a                St                Che                ...
ec2-54-175-46-24.compute-1.a                St                lie                12.
ec2-54-175-46-24.compute-1.amazonaws.com resolving cookbooks for run list: []
ec2-54-175-46-24.compute-1.amazonaws.com Synchronizing Cookbooks:
ec2-54-175-46-24.compute-1.amazonaws.com Compiling Cookbooks...
ec2-54-175-46-24.compute-1.amazonaws.com [2017-09-16T16:51:21+00:00] WARN: Node
node1 has an empty run list.
ec2-54-175-46-24.compute-1.amazonaws.com Converging 0 resources
ec2-54-175-46-24.compute-1.amazonaws.com
ec2-54-175-46-24.compute-1.amazonaws.com Running handlers:
```

Public IP Address or Fully Qualified Domain Name

user name

password

sudo flag

node name

©2017 Chef Software Inc.

CHEF

GL: Bootstrap on EC2

```
$ knife bootstrap -i ~\.ssh\id_rsa centos@ec2-xxx-xxx-xxx-xxx.us-west-2.compute.amazonaws.com -N node1 --sudo
```

```
C:\Users\chef\cookbooks\chef-repo\cookbooks> knife bootstrap -i ~\.ssh\id_rsa centos@ec2-50-112-15-172.us-west-2.compute.amazonaws.com -N Node1 --sudo
Creating new client for Node1
Creating new node for Node1
Connecting to ec2-50-112-15-172.us-west-2.compute.amazonaws.com
ec2-50-112-15-172.us-west-2.compute.amazonaws.com -----> Installing Chef Omnibus (-v 13)
ec2-50-112-15-172.us-west-2.compute.amazonaws.com downloading https://omnitruck
```

©2017 Chef Software Inc.

CHEF

GL: Run 'knife node list' Again

```
$ knife node list
```

```
node1
```

©2017 Chef Software Inc.

GL: View More Information About Your Node

```
$ knife node show node1
```

```
Node Name:   node1
Environment: _default
FQDN:        ip-172-31-21-7.ec2.internal
IP:          34.201.166.108
Run List:
Roles:
Recipes:
Platform:    centos 6.9
Tags:
```

©2017 Chef Software Inc.

GL: Add a Recipe to a Run List

```
$ knife node run_list add node1 "recipe[apache]"
```

```
node1:
  run_list: recipe[apache]
```

©2017 Chef Software Inc.

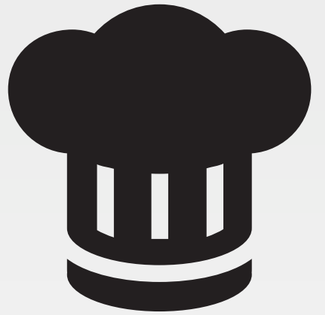
GL: ssh to node1 and Converge Recipe

```
$ knife ssh 'name:node1' 'sudo chef-client' -x
centos -i ~\.ssh\id_rsa
```

```
Starting Chef Client, version 13.2.20
resolving cookbooks for run list: ["apache"]
Synchronizing Cookbooks:
  - apache (0.2.1)
Installing Cookbook Gems:
Compiling Cookbooks...
Converging 3 resources
Recipe: apache::server
…
- start service service[httpd]
Running handlers:
```

©2017 Chef Software Inc.

CHEF



Hosted Chef

More easily manage multiple nodes

Objective:

- ✓ Create a Hosted Chef Account
- ✓ Upload your cookbooks to the Hosted Chef Server
- ✓ Add a new node as a managed node

©2017 Chef Software Inc.

DISCUSSION

Discussion

What is the benefit of storing cookbooks in a central repository?

What is the primary tool for communicating with the Chef Server?

How did you add a node to your organization?

©2017 Chef Software Inc.

CHEF

DISCUSSION

Q&A

What questions can you help you answer?

- Chef Server
- Managed Chef
- Berkshelf
- Bootstrapping Nodes

©2017 Chef Software Inc.

CHEF™

©2017 Chef Software Inc.