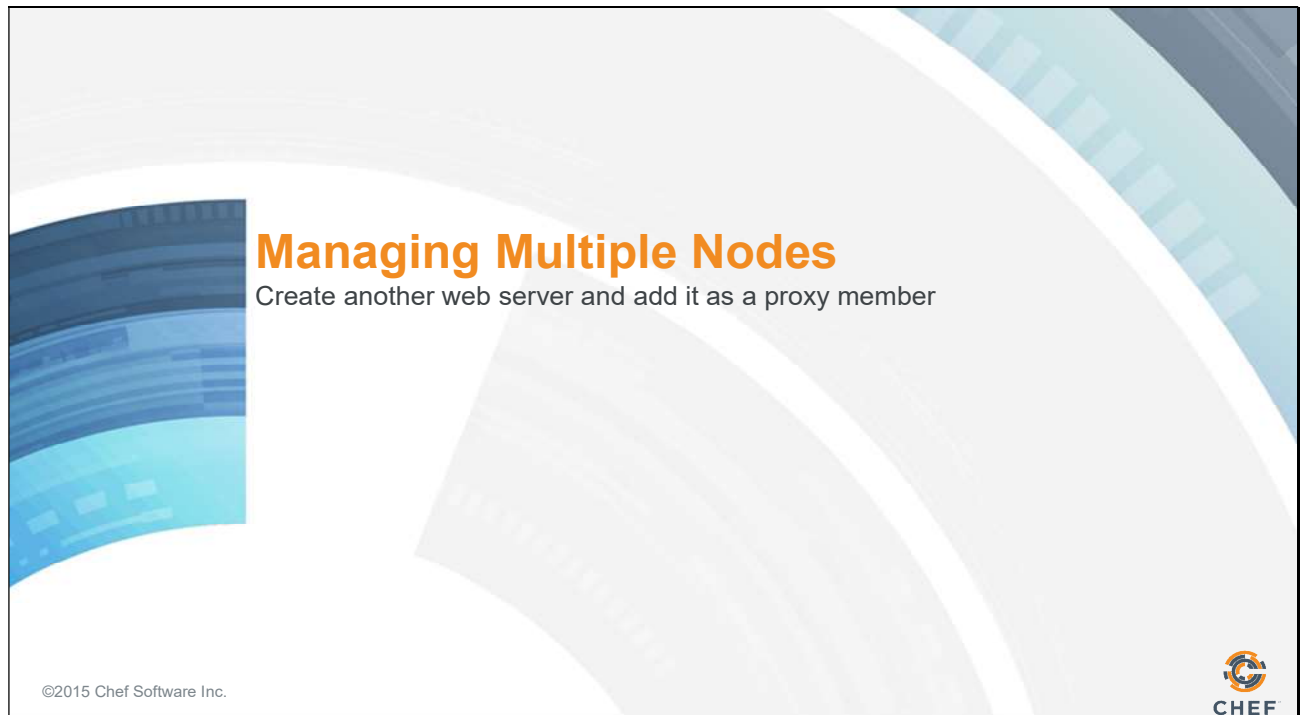


## 11: Managing Multiple Nodes



This section's goal is to have you bootstrap another node, this time a web server, and add it to the proxy members.

## Slide 2

## Objectives



After completing this module, you should be able to

- Bootstrap, update the run\_list, and run chef-client on a node
- Append values to an attribute within a recipe
- Version a cookbook and upload it to the Chef Server

In this module you will learn how to bootstrap, update the run list, and run chef-client on a node. You will also learn how to update a default attribute within a recipe, version and upload a cookbook.

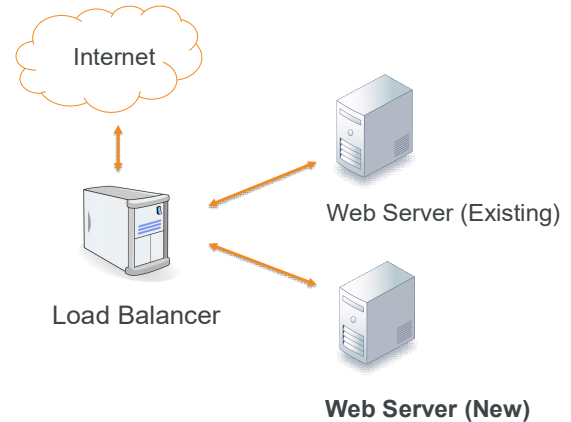
## Slide 3

## Managing User Traffic



You already configured the load balancer and one web server node.

In this module you'll add another node to the load balancer's list of web server's it is serving.




After completing this module, you will have configured three nodes:

Node 1: A web server

Node 2: The load balancer


Node 3: Another web server

## Slide 4



## Lab: Another Web Node

- ☐ Bootstrap a new node
- ☐ Update the run list of the new node to include the web server cookbook
- ☐ Login to that system and run chef-client
- ☐ Verify that the node's web server is functional

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Now it's time to create a third node. The third node will be the second web server node.

We will provide you with a new node for the following exercise.

Instructor Note: Allow 10 minutes to complete this exercise

## Slide 5

## Lab: Bootstrap the New Node



```
$ knife bootstrap windows winrm FQDN -x USER -P PWD -N node3
```

```
Connecting to ec2-54-210-86-164.compute-1.amazonaws.com
ec2-54-210-86-164.compute-1.amazonaws.com Starting first Chef Client run...
ec2-54-210-86-164.compute-1.amazonaws.com Starting Chef Client, version 12.3.0
ec2-54-210-86-164.compute-1.amazonaws.com resolving cookbooks for run list: []
ec2-54-210-86-164.compute-1.amazonaws.com Synchronizing Cookbooks:
ec2-54-210-86-164.compute-1.amazonaws.com Compiling Cookbooks...
ec2-54-210-86-164.compute-1.amazonaws.com [2015-09-16T17:36:14+00:00] WARN: Node
node3 has an empty run list.
ec2-54-210-86-164.compute-1.amazonaws.com Converging 0 resources
ec2-54-210-86-164.compute-1.amazonaws.com
ec2-54-210-86-164.compute-1.amazonaws.com Running handlers:
ec2-54-210-86-164.compute-1.amazonaws.com Running handlers complete
ec2-54-210-86-164.compute-1.amazonaws.com Chef Client finished, 0/0 resources
updated in
```

Bootstrap the new node and name it node3.

## Slide 6

## Lab: Verify the New Node



```
$ knife node show node3
```

```
Node Name:    node3
Environment:  _default
FQDN:         WIN-F9R1IJ8VE59
IP:           52.90.82.67
Run List:
Roles:
Recipes:
Platform:    windows 6.3.9600
Tags:
```

Verify that you bootstrapped the node.

## Slide 7

## Lab: Set the Run List



```
$ knife node run_list add node3 "recipe[iis-demo]"
```

```
node3:  
  run_list: recipe[iis-demo]
```

Set the run list for this node by running the iis-demo cookbook's default recipe.

## Slide 8

## Lab: Converge the Run List



```
$ knife winrm *:~ -x USERNAME -P PWD -a ipaddress "chef-client"
```

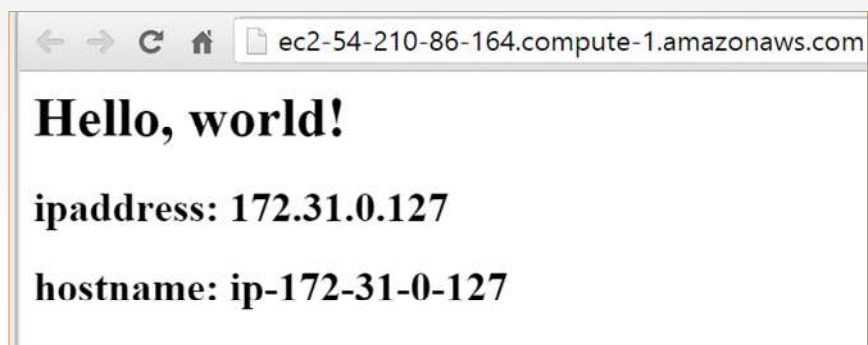
```
ec2-54-175-46-24.compute-1.amazonaws.com Starting Chef Client, version 12.3.0
ec2-54-210-192-12.compute-1.amazonaws.com Starting Chef Client, version 12.3.0
ec2-54-210-86-164.compute-1.amazonaws.com Starting Chef Client, version 12.3.0
ec2-54-175-46-24.compute-1.amazonaws.com resolving cookbooks for run list: ["iis-demo"]
ec2-54-210-86-164.compute-1.amazonaws.com resolving cookbooks for run list: ["iis-demo"]
ec2-54-210-86-164.compute-1.amazonaws.com Synchronizing Cookbooks:
ec2-54-210-192-12.compute-1.amazonaws.com resolving cookbooks for run list: ["myiis-lb"]
ec2-54-175-46-24.compute-1.amazonaws.com Synchronizing Cookbooks:
ec2-54-175-46-24.compute-1.amazonaws.com   - iis-demo
ec2-54-175-46-24.compute-1.amazonaws.com Compiling Cookbooks...
ec2-54-175-46-24.compute-1.amazonaws.com Converging 3 resources
ec2-54-175-46-24.compute-1.amazonaws.com Recipe: iis-demo::server
```

Apply that run list by logging into that node and running chef-client or remotely administer the node with the 'knife winrm' command as shown here.



## Slide 9

## Verify that the New Node Serves the Page



Verify that the node serves up the default html page that contains the node's internal IP address and hostname.

## Slide 10



## Lab: Update the Load Balancer

- ☐ Update the wrapped proxy server cookbook to include the new web node as a member.
- ☐ Upload that cookbook to the Chef Server
- ☐ Login to that system and run chef-client
- ☐ Verify that the load balancer delivers traffic to both web server nodes.

Now that you have the third node, it is time to add that node to the member's list for the load balancer.

Instructor Note: Allow 15 minutes to complete this exercise

## Slide 11

## Lab: Capture Node's Public Host Name and IP



```
$ knife node show node3 -a cloud
```

```
node3:
  cloud:
    local_hostname: ip-172-31-8-64.ec2.internal
    local_ipv4: 172.31.8.64
    private_ips: 172.31.8.64
    provider: ec2
    public_hostname: ec2-54-176-64-173.us-west-1.compute.amazonaws.com
    public_ips: 54.175.46.48
    public_ipv4: 54.175.46.48
```

If you use 'knife node show' to display the 'cloud' attribute for node3, you will see the local, private, and public connection information.

Capture and write down the public hostname and the public ipv4 address of node3. You will need this in the recipe you are going to write.

## Slide 12

## Lab: Add the Other Web Server to LB

 ~\chef-repo\cookbooks\myiis-lb\recipes\default.rb

```
node.default['iis-lb']['members'] = [
  {
    'address' => 'ec2-52-8-71-11.us-west-1.compute.amazonaws.com',
    'weight' => 100,
    'port' => 80,
    'ssl_port' => 80
  },
  {
    'address' => 'ec2-54-176-64-173.us-west-1.compute.amazonaws.com',
    'weight' => 100,
    'port' => 80,
    'ssl_port' => 80
  }
]

include_recipe 'iis-lb::default'
```

Add the second web server (node3) to the load balancer's (LB) members list. You may need to run 'knife node show node3 -a cloud' to get the hostname and ipaddress values.

## Lab: Update the Version

```
~\chef-repo\cookbooks\myiis-lb\metadata.rb

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

depends 'iis-lb'
```

Update the version number in myiis-lb cookbook's metadata.

## Lab: Upload the Updated myiis-lb Cookbook



```
$ cd ~\chef-repo\cookbooks\myiis-lb  
$ berks install
```

```
Resolving cookbook dependencies...  
Fetching 'myiis-lb' from source at .  
Fetching cookbook index from https://supermarket.chef.io...  
Using build-essential (2.2.3)  
Using cpu (0.2.0)  
Using iis-lb (1.6.6)  
Using myiis-lb (0.2.0) from source at .
```

Change into the 'myiis-lb' cookbook directory and then run 'berks install' to install any dependencies for the 'myiis-lb' cookbook.

Instructor Note: Any time you change the version number of a cookbook Berkshelf requires you re-evaluate the dependencies even if they dependencies have not changed.

## Slide 15

## Lab: Upload the Cookbook to Chef Server



```
$ berks upload
```

```
Uploaded build-essential (2.2.3) to:  
'https://api.opscode.com:443/organizations/steveessentials2'  
Uploaded iis-lb (1.6.6) to: 'https://api.opscode.com:443/organizations/steveessentials2'  
Uploaded myiis-lb (0.2.0) to: 'https://api.opscode.com:443/organizations/steveessentials2'
```

Run 'berks upload' to upload the myiis-lb cookbook to Chef Server.

## Lab: Converge the Node



```
$ knife winrm *:~ -x USERNAME -P PWD -a ipaddress "chef-client"
```

```
ec2-54-210-192-12.compute-1.amazonaws.com Starting Chef Client, version 12.3.0
ec2-54-175-46-24.compute-1.amazonaws.com Starting Chef Client, version 12.3.0
ec2-54-210-86-164.compute-1.amazonaws.com Starting Chef Client, version 12.3.0
ec2-54-210-192-12.compute-1.amazonaws.com resolving cookbooks for run list: ["myiis-
lb"]
ec2-54-175-46-24.compute-1.amazonaws.com resolving cookbooks for run list: ["iis-
demo"]
ec2-54-175-46-24.compute-1.amazonaws.com Synchronizing Cookbooks:
ec2-54-175-46-24.compute-1.amazonaws.com   - iis-demo
ec2-54-175-46-24.compute-1.amazonaws.com Compiling Cookbooks...
ec2-54-210-192-12.compute-1.amazonaws.com Synchronizing Cookbooks:
ec2-54-175-46-24.compute-1.amazonaws.com Converging 3 resources
ec2-54-175-46-24.compute-1.amazonaws.com Recipe: iis-demo::server
ec2-54-210-192-12.compute-1.amazonaws.com   - build-essential
```

Converge the node by logging into that node and running 'chef-client' or remotely administer the node with the 'knife winrm' command as shown here.

Within the output you should see the iis-lb configuration file will update with a new entry that contains the information of the second member (node3).



## Slide 17

## Lab: Test the Load Balancer

The image displays three browser windows, each showing a 'Hello, world!' message and system information. A blue arrow points from the top window to the bottom-left window, indicating a switch in the server being accessed. The system information for all three windows is identical:

- ipaddress: 172.31.54.225
- hostname: WIN-3VTFMHJB0T3
- total memory: 16776816kB
- CPU Mhz: 2400

The browser windows are titled with their respective EC2 instance IDs: 'ec2-52-91-186-11.compute-1.amazonaws.com', 'ec2-52-90-104-159.compute-1.amazonaws.com', and 'ec2-54-152-109-197.compute-1.amazonaws.com'.

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Point a web browser to the URL of your Proxy server and then click Refresh a few times. You should see each of your web server's HTML page as the Proxy server switches between each web server.

This is not a very scientific way of seeing that the proxy server is balancing requests between these two web nodes.

## Slide 18

# Lab: Test the Load Balancer

The image displays three browser windows, each showing a 'Hello, world!' message and system information. A blue arrow points from the top window to the bottom right window, indicating a load balancer routing request.

**Top Window:**

```
Hello, world!  
ipaddress: 172.31.49.133  
hostname: WIN-3VTFMHJB0T3  
total memory: 16776816kB  
CPU Mhz: 2400
```

**Bottom Left Window:**

```
Hello, world!  
ipaddress: 172.31.54.225  
hostname: WIN-3VTFMHJB0T3  
total memory: 16776816kB  
CPU Mhz: 2400
```

**Bottom Right Window:**

```
Hello, world!  
ipaddress: 172.31.49.133  
hostname: WIN-3VTFMHJB0T3  
total memory: 16776816kB  
CPU Mhz: 2400
```

Slide 19


# DISCUSSION

## Discussion

What is the process to setup a third web node?

What is the process for removing a web node?


What is the most manual part of the process?



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Answer these questions.


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

Slide 20

# DISCUSSION


## Q&A

What questions can we help you answer?



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Slide 21

