

Search

Update a Cookbook to Dynamically Use Nodes with the Web Role

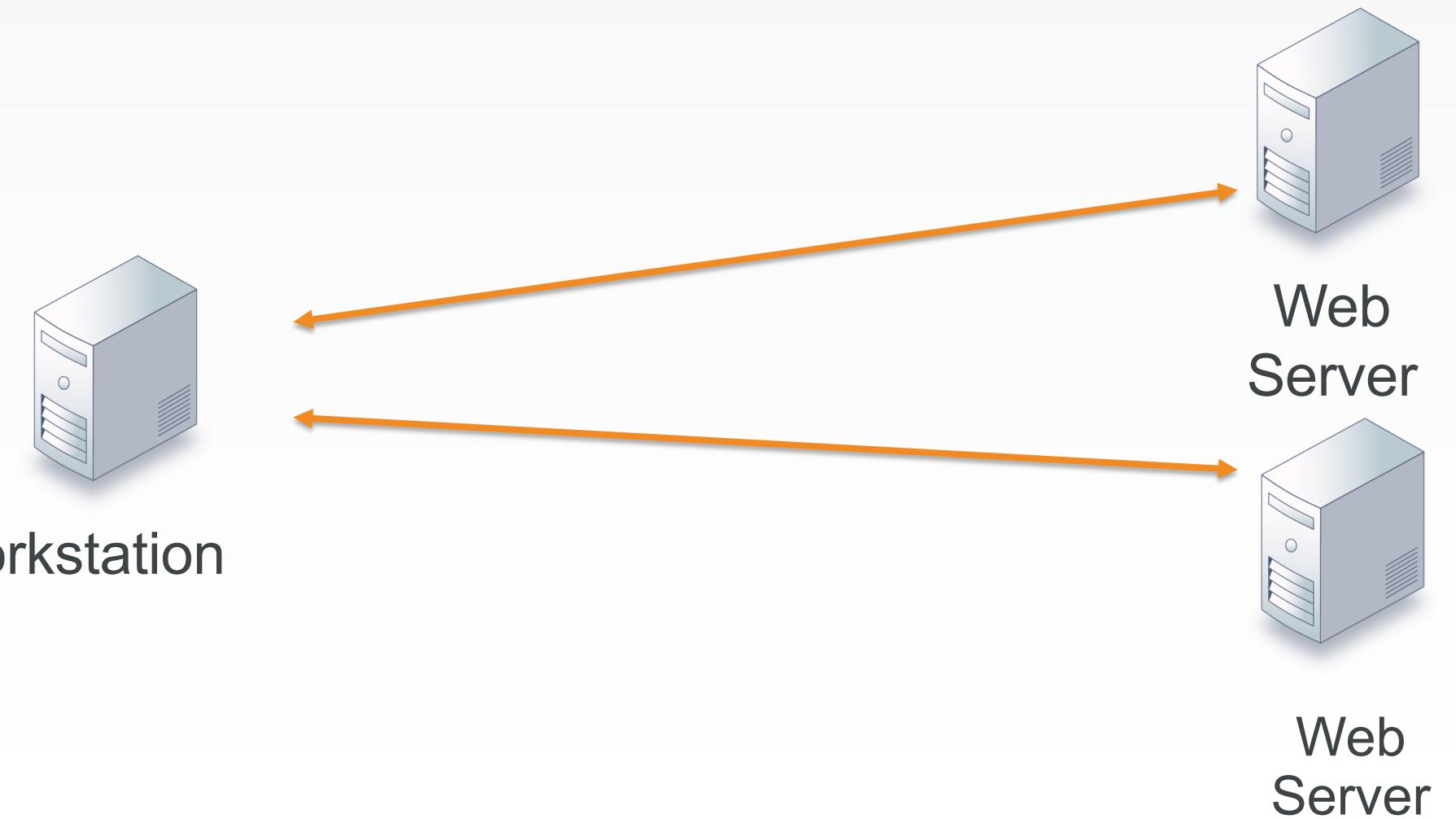
Objectives

After completing this module, you should be able to:

- Describe the query syntax used in search
- Build a search into your recipe code
- Create a Ruby Array and Ruby Hash
- Create load balancer cookbook that dynamically finds nodes with an assigned role

Our current Environment

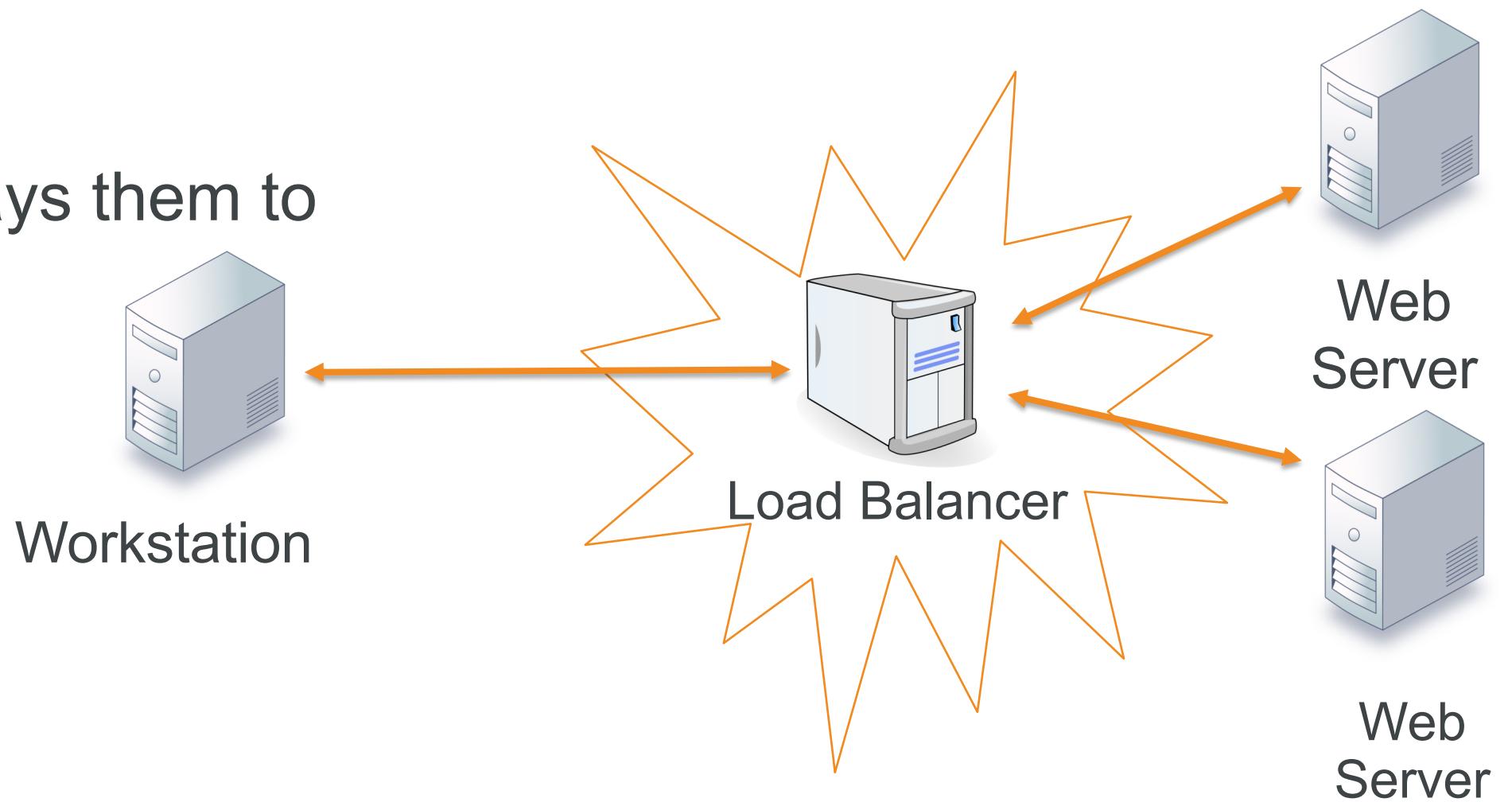
Currently we have two webservers
that we must browse to individually



Introducing a Load Balancer

Adding a load balancer will allow us to better grow our infrastructure.

Receives requests and relays them to other systems.

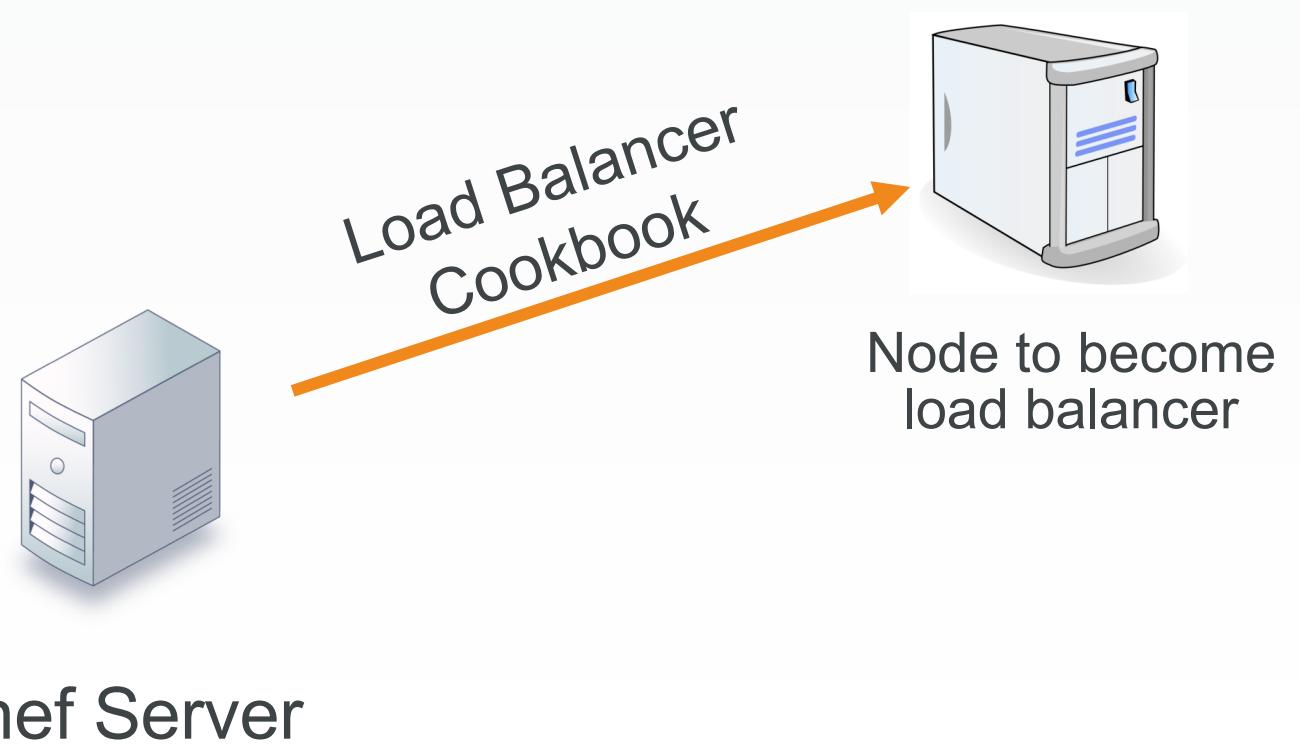


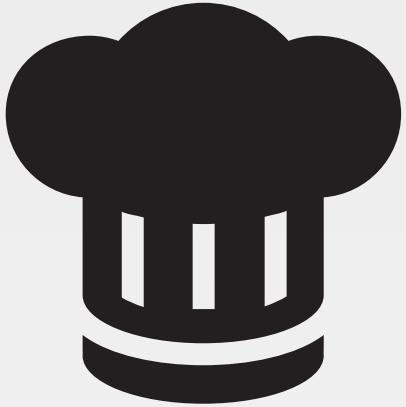
Load Balancer

Work that needs to be accomplished to setup a load balancer within our infrastructure:

Write a load balancer cookbook.

Establish a new node within our organization to which we apply that cookbook.





Load Balancer

Adding a load balancer will allow us to better grow our infrastructure.

Objective:

- Find or Create a Cookbook to Manage a load balancer
- Configure the load balancer to send traffic to the web servers
- Upload cookbook to Chef Server
- Create 'load_balancer' role that includes the 'base' role
- Bootstrap a new node (node3) that runs the load balancer cookbook (via 'load_balancer' role)

Supermarket Cookbooks

We will use the iis-lb community cookbook

The screenshot shows the Chef Supermarket homepage with a search bar and navigation links. Below the search bar, the iis-lb cookbook is displayed. The page includes the cookbook's name, version (0.2.4), description, maintainer information (binamov, Bakh Inamov), and download options.

CHEF SUPERMARKET

COOKBOOKS CONTRIBUTOR TOOLS & PLUGINS CREATE ACCOUNT SIGN IN

New Supermarket Announcements!

Cookbooks Search GO Advanced Options

RSS iis-lb (7) Versions 0.2.4

Installs/Configures IIS as a web load-balancer

Berkshelf Librarian Knife

cookbook 'iis-lb', '~> 0.2.4'

Follow 0

README Dependencies Foodcritic

code climate coverage unknown

iis-lb

This cookbook configures IIS as a simple web load-balancer by creating an IIS Server Farm. It also allows you to add servers to the farm by passing a `node['iis-lb']['members']` hash.

DISCLAIMER

DETAILS

View Source View Issues

UPDATED DECEMBER 31, 2015 Created on December 24, 2015

PLATFORMS

LICENSE all_rights

Download Cookbook

Supermarket Cookbooks

We don't want to change the community iis-lb cookbook, so we'll wrap it in a myiis_lb cookbook

Wrapper Cookbook

iis-lb
cookbook
(Attributes)

(New additional attributes)

GL: Generate the Wrapper Cookbook



```
> cd ~\chef-repo  
> chef generate cookbook cookbooks\myiis_lb
```

Generating cookbook myiis_lb

- 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\myiis_lb` to enter it.

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

GL: Create a dependency and set 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        '0.1.0'
```

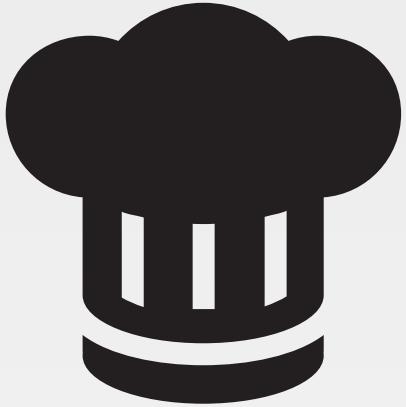
```
depends 'iis-lb'
```

+

Demo: Edit the myiis_lb Default Recipe

~\chef-repo\cookbooks\myiis_lb\recipes\default.rb

```
#  
# Cookbook Name:: myiis-lb  
# Recipe:: default  
  
#  
# Copyright (c) 2018 The Authors, All Rights Reserved.  
  
include_recipe 'iis-lb::default'
```



Load Balancer

Adding a load balancer will allow us to better grow our infrastructure.

Objective:

- ✓ Find or create a cookbook to manage a load balancer
- Configure the load balancer to send traffic to the web servers
- Upload cookbook to Chef Server
- Create 'load_balancer' role that includes the 'base' role
- Bootstrap a new node (node3) that runs the load balancer cookbook (via 'load_balancer' role)

iis-lb Supermarket Cookbook

In the iis-lb cookbook, web servers in the load balancing pool are listed as attributes (iis-lb/attributes/default.rb)

The example in the cookbook's **README.md** illustrates how to overwrite these, but we need to add the IP Address or Hostname of our **node1** and **node2**

Usage

Specify your servers by setting the `node['iis-lb']['members']` attribute hash in a wrapper cookbook. Then include the `'iis-lb::default'` recipe. This creates the Server Farm and adds your servers to it. For example:

```
# contents of chef-repo/cookbooks/my-wrapper-cookbook/recipes/default.rb
node.default['iis-lb']['members'] = [
  {
    'address' => 'localhost',
    'weight' => 100,
    'port' => 4000,
    'ssl_port' => 4000
  },
  {
    'address' => '127.0.0.1',
    'weight' => 100,
    'port' => 4001,
    'ssl_port' => 4001
  }
]
```

<https://docs.chef.io/supermarket.html#wrapper-cookbooks>

Demo: myiis_lb default Recipe Could Resemble This

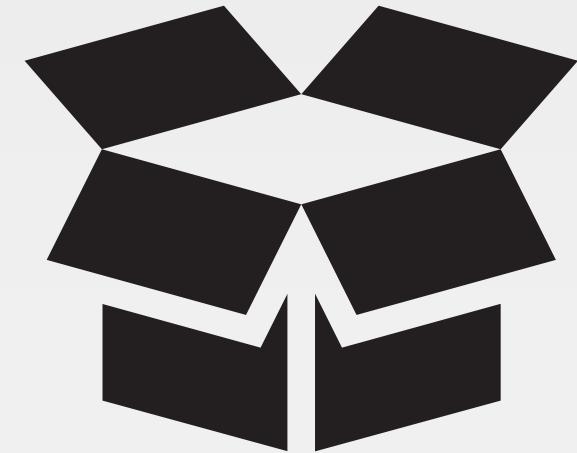
```
~\chef-repo\cookbooks\myiis_lb\recipes\default.rb

node.default['iis-lb']['members'] = [
  {
    'address' => '34.196.63.231',
    'weight' => 100,
    'port' => 80,
    'ssl_port' => 80
  },
  {
    'address' => '34.196.104.17',
    'weight' => 100,
    'port' => 80,
    'ssl_port' => 80
  }
]

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

CONCEPT

Using Search



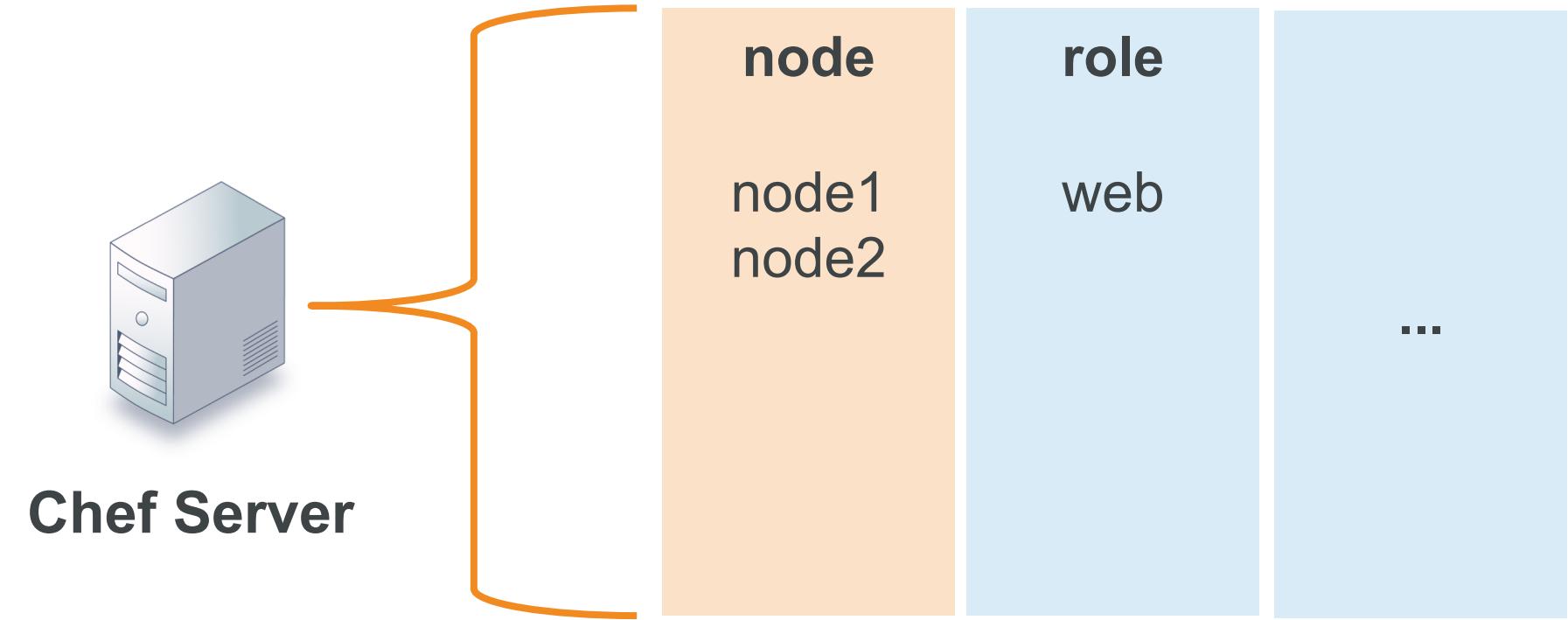
It seems inefficient to have to update a cookbook recipe each time we add another web server

To add new web servers to load balancing pool, we would need to bootstrap a new web server and then update our load balancer's `myiis_lb` cookbook recipe

We'll use search to update the load balancer automatically

The Chef Server and Search

Chef Server maintains a representation of all the nodes, roles, clients, etc. within our infrastructure. This information can be used to help our recipes discover other services within our organization.

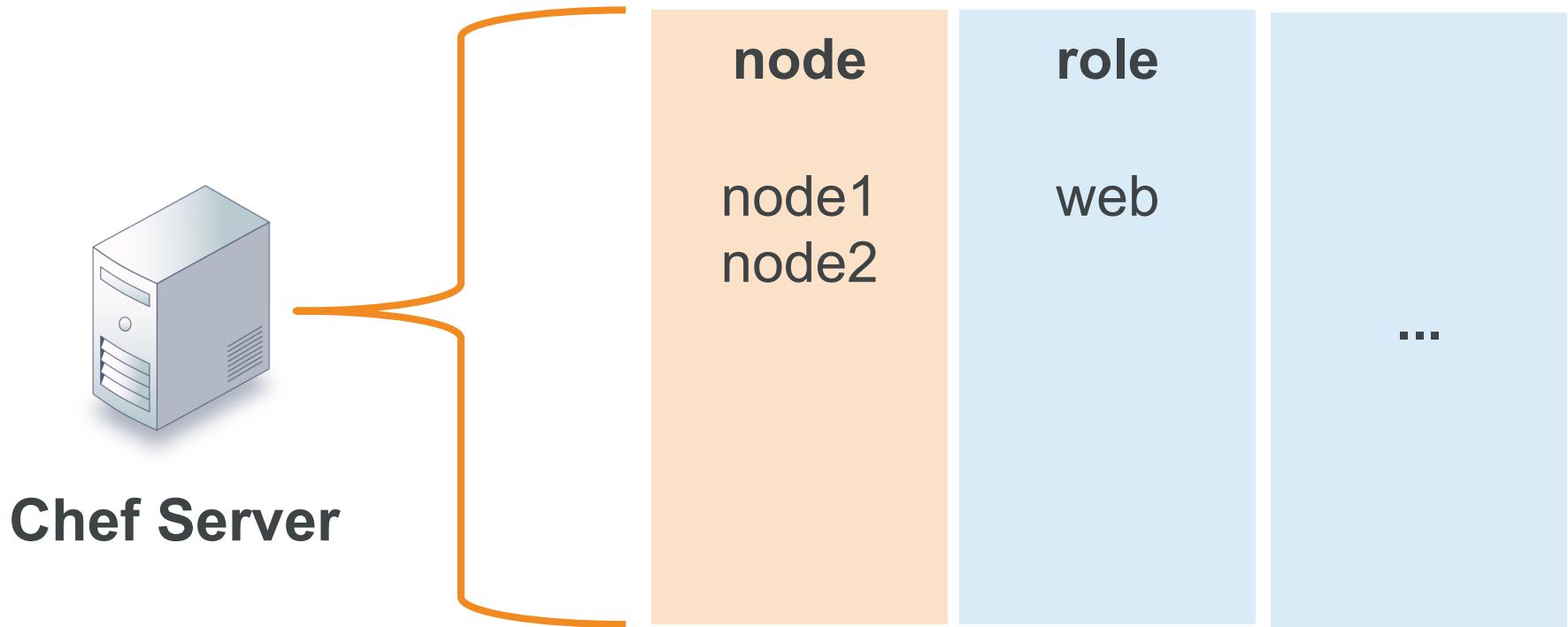


https://docs.chef.io/chef_search.html

https://docs.chef.io/chef_search.html#search-indexes

The Chef Server and Search

We can ask the Chef Server to return all the nodes or a subset of nodes based on the query syntax that we provide it through **knife search** or within our recipes through **search** method.



Query	knife search command	search method	results
Find me all the nodes with the <i>name</i> node1	<code>knife search node name:node1</code>	<code>search('node', 'name:node1')</code>	node1
Find me all the nodes with the <i>role</i> web	<code>knife search node role:web</code>	<code>search('node', 'role:web')</code>	node1, node2

Search Syntax

A search query is comprised of two parts: the key and the search pattern. A search query has the following syntax:

key:search_pattern

...where key is a field name that is found in the JSON description of an indexable object on the Chef server (node, role, environment, databag) and search_pattern defines what will be searched for

The search criteria "`*:*`" returns every node

GL: View Information for All Nodes



```
> knife search node "*:*"
```

```
Node Name:    node1
Environment:  _default
FQDN:        WIN-DCK5NTVVLBH
IP:          34.196.63.231
Run List:    role[web]
Roles:       web, base
Recipes:     my_chef_client, my_chef_client::default, myiis, myiis::default, chef-client::default, chef-client::task, myiis::server
Platform:    windows 6.3.9600
Tags:

Node Name:    node2
Environment:  _default
FQDN:        WIN-DCK5NTVVLBH
IP:          34.196.104.17
Run List:    role[web]
Roles:       web, base
Recipes:     my_chef_client, my_chef_client::default, myiis, myiis::default, chef-client::default, chef-client::task, myiis::server
Platform:    windows 6.3.9600
Tags:
```

GL: Narrow the Search for all Web Nodes



```
> knife search node "role:web" -a cloud.public_hostname
```

node1:

cloud.public_hostname: ec2-34-196-63-231.compute-1.amazonaws.com

node2:

cloud.public_hostname: ec2-34-196-104-17.compute-1.amazonaws.com

LOCAL

Search Syntax within a Recipe

```
all_web_nodes = search('node', 'role:web')
```

creates and names a variable

assigns the value of the
operation on the right
into the variable on the left

the index or items to search

invokes the search method

the search criteria - key:value

Search Syntax within a Recipe

```
all_web_nodes = search('node', 'role:web')
```

Search the Chef Server for all **nodes** that have the **role** equal to '**web**' and store the results into a local variable named '**all_web_nodes**'.

GL: Edit the myiis_lb Default Recipe

~\chef-repo\cookbooks\myiis_lb\recipes\default.rb

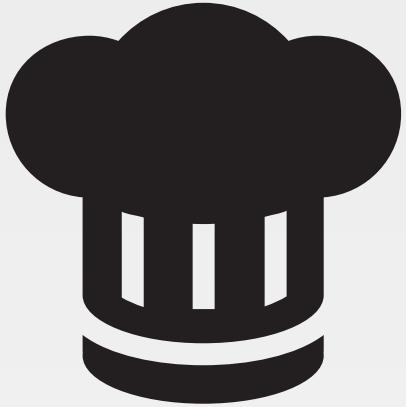
```
all_web_nodes = search('node', 'role:web')

members = []

all_web_nodes.each do |web_node|
  member = {
    'address' => web_node['cloud']['public_hostname'],
    'weight' => 100,
    'port' => 80,
    'ssl_port' => 80
  }
  members.push(member)
end

node.default['iis-lb']['members'] = members

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



Load Balancer

Adding a load balancer will allow us to better grow our infrastructure.

Objective:

- ✓ Find or create a cookbook to manage a load balancer
- ✓ Configure the load balancer to send traffic to the web servers
- Upload cookbook to Chef Server
- Create 'load_balancer' that includes the 'base' role
- Bootstrap a new node (node3) that runs the load balancer cookbook (via 'load_balancer' role)



Lab: Upload the Cookbook

- Upload the cookbook to the Chef Server

Lab: Install Cookbook Dependencies



```
> 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 compat_resource (12.16.3)  
Installing iis (5.0.5)  
Installing iis-lb (0.2.4)  
Using myiis_lb (0.1.0) from source at .  
Using ohai (4.2.3)  
Installing webpi (3.1.0)  
Using windows (2.1.1)
```

LOCAL

Lab: Upload the Cookbook to Chef Server



```
> berks upload
```

```
Skipping compat_resource (12.16.3) (frozen)
Uploaded iis (5.0.5) to: 'https://api.chef.io:443/organizations/awesomestudent'
Uploaded iis-lb (0.2.4) to: 'https://api.chef.io:443/organizations/awesomestudent'
Uploaded myiis_lb (0.1.0) to: 'https://api.chef.io:443/organizations/awesomestudent'
Skipping ohai (4.2.3) (frozen)
Uploaded webpi (3.1.0) to: 'https://api.chef.io:443/organizations/awesomestudent'
Skipping windows (2.1.1) (frozen)
```

LOCAL

Lab: Verify the Cookbook Upload



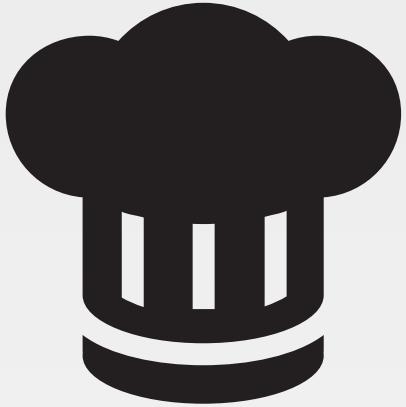
```
> knife cookbook list
```

```
chef-client          7.1.0
compat_resource     12.16.3
cron                3.0.0
iis                 5.0.5
iis-lb               0.2.4
logrotate            2.1.0
my_chef_client      0.1.1
myiis               0.2.1
myiis_lb             0.1.0
ohai                4.2.3
webpi               3.1.0
windows              2.1.1
workstation          0.1.0
```



Lab: Upload the Cookbook

- ✓ Upload the cookbook to the Chef Server



Load Balancer

Adding a load balancer will allow us to better grow our infrastructure.

Objective:

- ✓ Find or create a cookbook to manage a load balancer
- ✓ Configure the load balancer to send traffic to the web servers
- ✓ Upload cookbook to Chef Server
- Create 'load_balancer' role that includes the 'base' role
- Bootstrap a new node (node3) that runs the load balancer cookbook (via 'load_balancer' role)

GL: Create the Load Balancer Role

~\chef-repo\roles\load_balancer.rb

```
name 'load_balancer'  
description 'Load Balancer'  
run_list 'role[base]', 'recipe[myiis_lb]'
```

GL: Upload the Role to the Chef Server



```
> cd ~\chef-repo  
> knife role from file load_balancer.rb
```

```
Updated Role load_balancer
```

PREREQUISITES

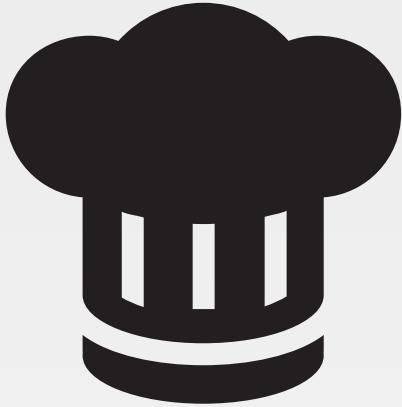
GL: Validate Chef Server Received It



```
> knife role list
```

```
base
load_balancer
web
```

PRIMER



Load Balancer

Adding a load balancer will allow us to better grow our infrastructure.

Objective:

- ✓ Find or create a cookbook to manage a load balancer
- ✓ Configure the load balancer to send traffic to the web servers
- ✓ Upload cookbook to Chef Server
- ✓ Create 'load_balancer' role that includes the 'base' role
- Bootstrap a new node (node3) that runs the load balancer cookbook (via 'load_balancer' role)

Lab: Bootstrap a New Node



```
> knife bootstrap windows winrm IP_OF_NODE3 -x USER -P  
Training1234 -N node3 -r "role[load_balancer]"
```

```
Creating new client for node3
```

```
Creating new node for node3
```

```
Waiting for remote response before bootstrap.34.196.106.169 .
```

```
34.196.106.169 Response received.
```

```
Remote node responded after 0.02 minutes.
```

```
Bootstrapping Chef on 34.196.106.169
```

```
34.196.106.169 Rendering "C:\Users\ADMINI~1\AppData\Local\Temp\bootstrap-3664-1485280632.bat" chunk 1
```

```
34.196.106.169 Rendering "C:\Users\ADMINI~1\AppData\Local\Temp\bootstrap-3664-1485280632.bat" chunk 2
```

```
34.196.106.169 Rendering "C:\Users\ADMINI~1\AppData\Local\Temp\bootstrap-3664-1485280632.bat" chunk 3
```

```
34.196.106.169 Rendering "C:\Users\ADMINI~1\AppData\Local\Temp\bootstrap-3664-1485280632.bat" chunk 4
```

```
34.196.106.169 Rendering "C:\Users\ADMINI~1\AppData\Local\Temp\bootstrap-3664-1485280632.bat" chunk 5
```

```
34.196.106.169 Rendering "C:\Users\ADMINI~1\AppData\Local\Temp\bootstrap-3664-1485280632.bat" chunk 6
```

```
34.196.106.169 Rendering "C:\Users\ADMINI~1\AppData\Local\Temp\bootstrap-3664-1485280632.bat" chunk 7
```

```
...
```

Lab: Validate the Run List



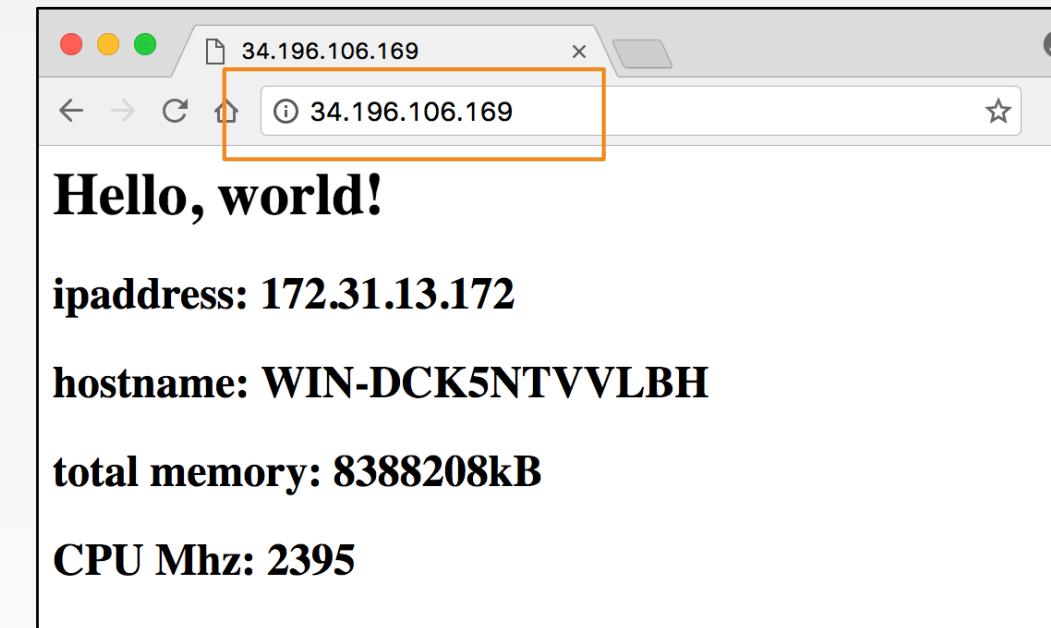
```
> knife node show node3
```

```
Node Name:      node3
Environment:    _default
FQDN:          WIN-DCK5NTVVLBH
IP:            34.196.106.169
Run List:       role[load_balancer]
Roles:          load_balancer, base
Recipes:        my_chef_client, my_chef_client::default, myiis_lb,
                myiis_lb::default, chef-client::default, chef-client::task, iis-lb::default,
                iis-lb::_arr, webpi::default, webpi::install-msi
Platform:       windows 6.3.9600
Tags:
```

LOCAL

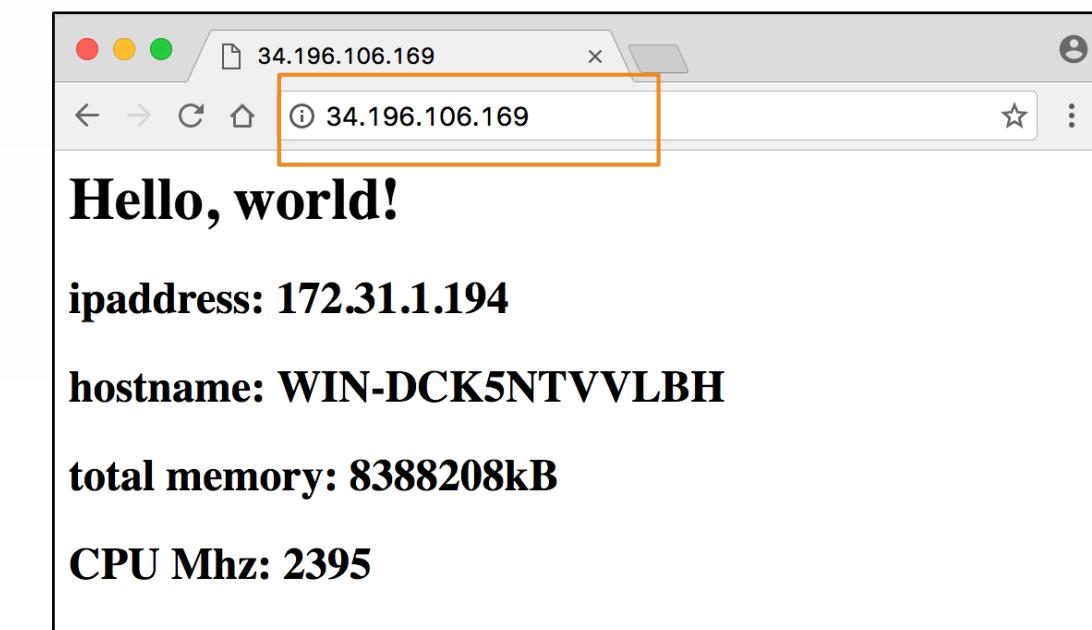
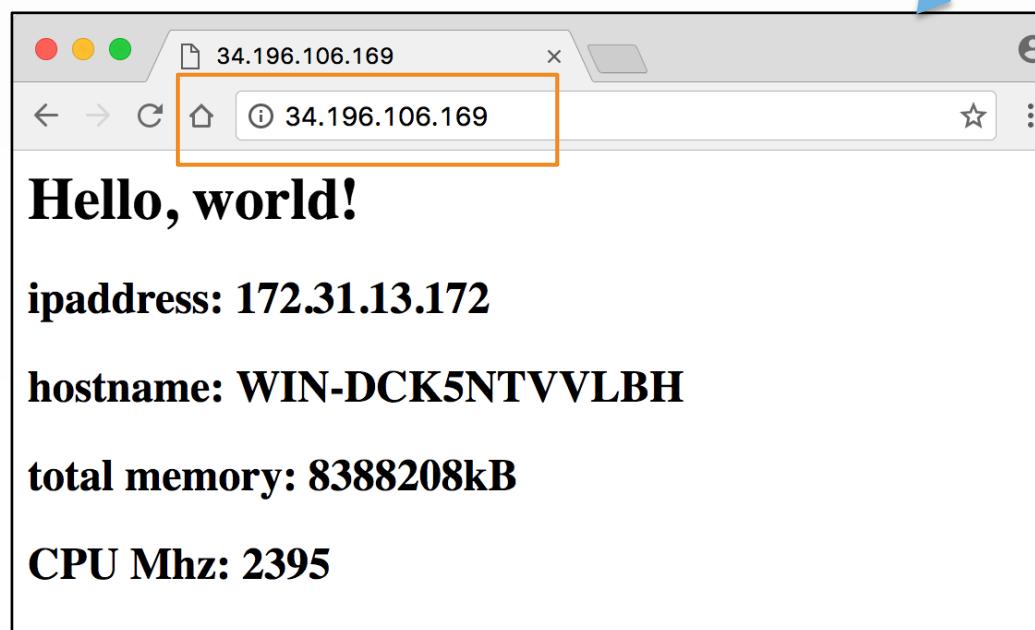
Point a web browser to the IP address of your load balancer node.

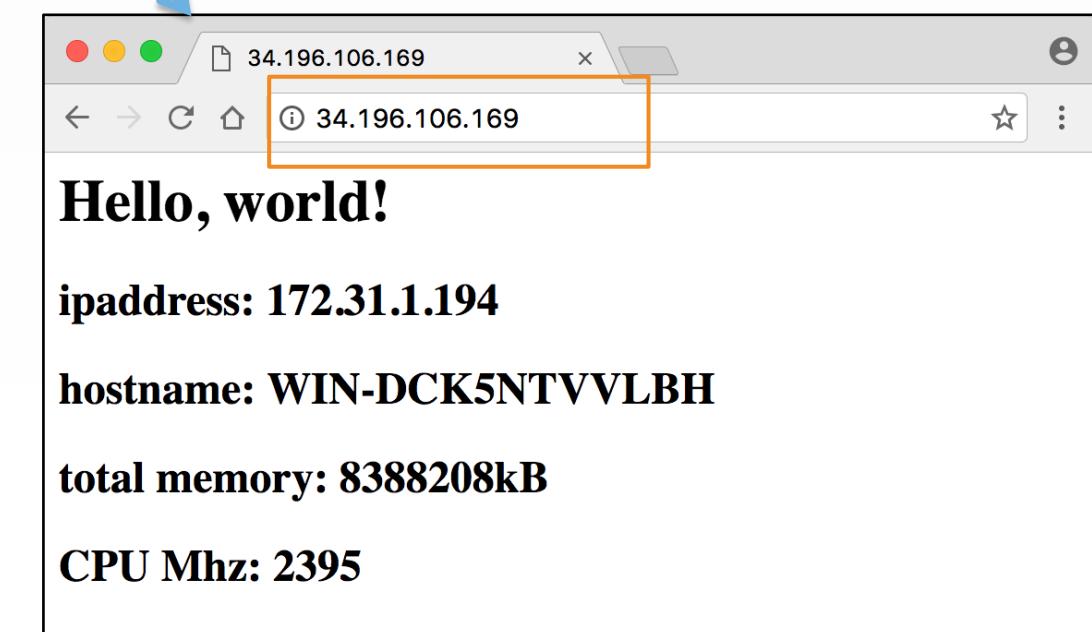
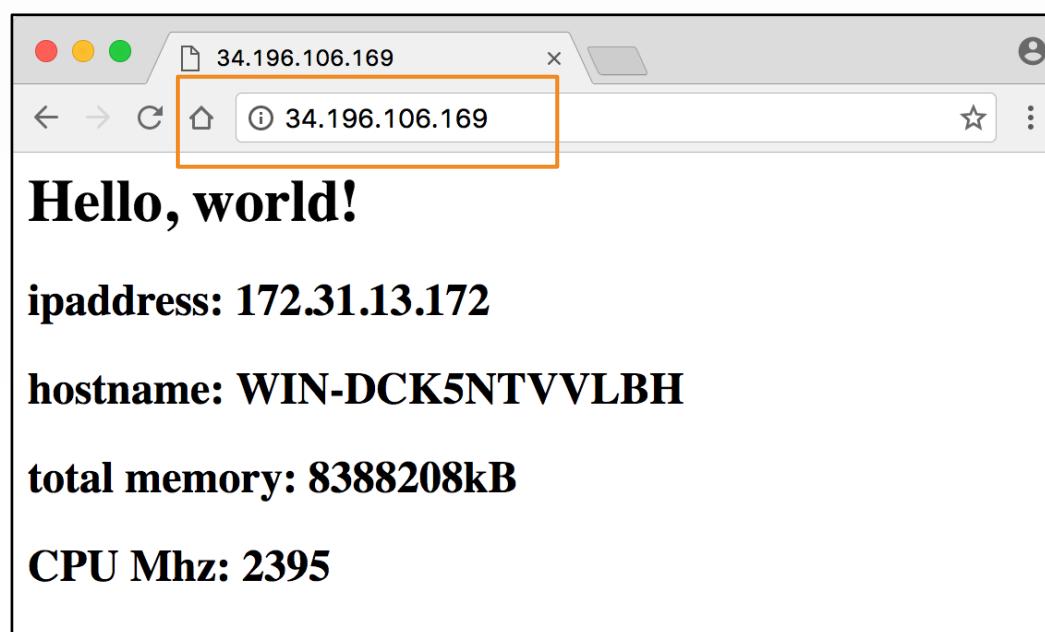
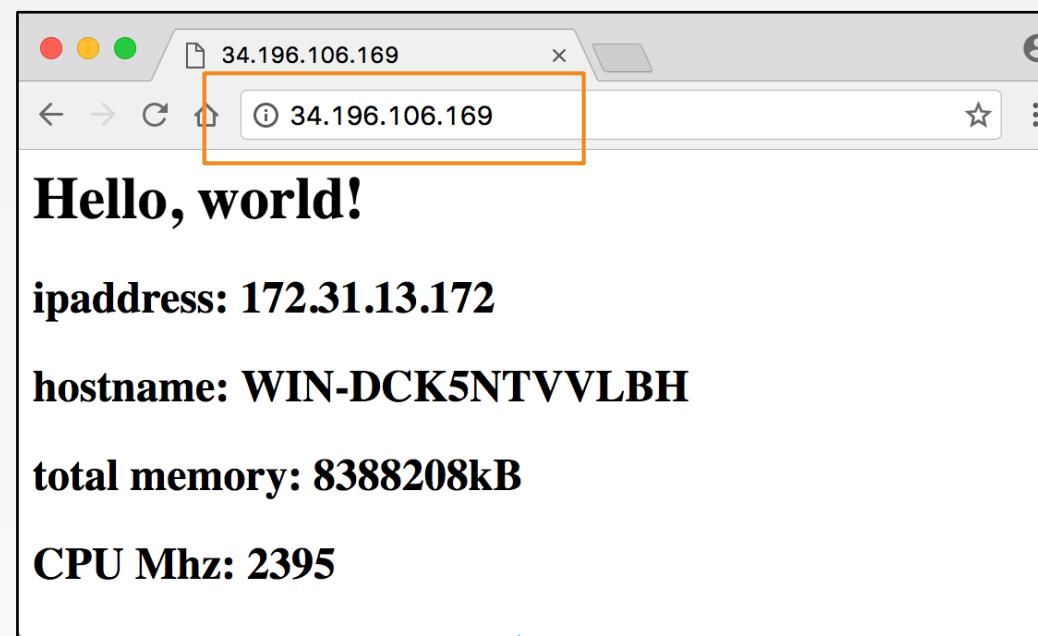
Refresh the page a few times to see the load balancer serve up each web server.



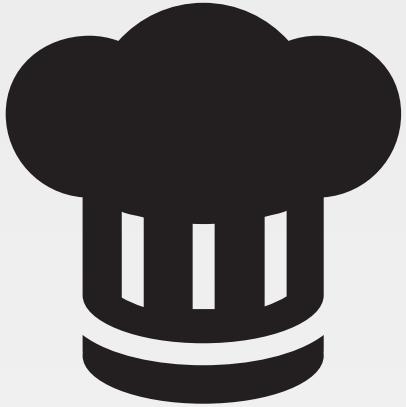
Please see notes below this slide.

NOTE: IIS Server has 60 second server side cache turned on by default





CHEF™



Load Balancer

Adding a load balancer will allow us to better grow our infrastructure.

Objective:

- ✓ Find or create a cookbook to manage a load balancer
- ✓ Configure the load balancer to send traffic to the web servers
- ✓ Upload cookbook to Chef Server
- ✓ Create 'load_balancer' role that includes the 'base' role
- ✓ Bootstrap a new node (node3) that runs the load balancer cookbook (via 'load_balancer' role)

DISCUSSION

Discussion



What happens when new web nodes are added to the organization? Removed?

What happens if you were to terminate a web node instance without removing it from the Chef Server?

DISCUSSION

Q&A



What questions can we help you answer?



CHEF™