Roles

Giving your Nodes a Role

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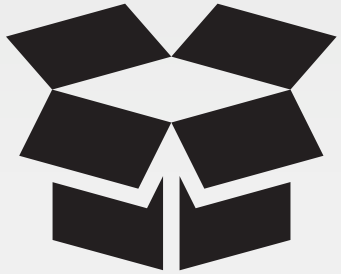
Objectives

After completing this module, you should be able to

- Assign roles to nodes so you can better describe them and configure them in a similar manner
- Set attribute values within roles

CONCEPT

Roles



A role describes a run list of recipes that are executed on the node.

A role may also define new defaults or overrides for existing cookbook attribute values.

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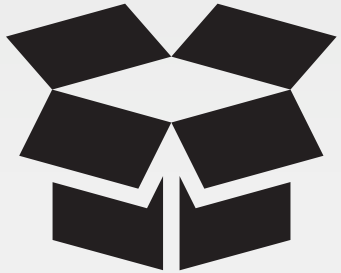
CONCEPT

Roles



You assign a role to a node in its run list.

This allows you to configure many similar nodes

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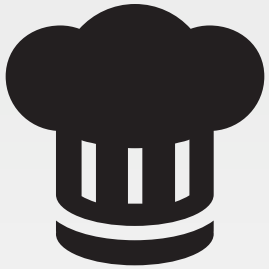

Lab: Roles for Everyone

We will give our nodes a role to better describe them and so we can configure them in a similar manner.

Objective:

- ❑ Give our loadbalancer node a "loadbalancer" Role
- ❑ Give our web nodes a "web" Role

Lab: Create the loadbalancer.rb

```
chef-repo/roles/loadbalancer.rb
```

```
name 'loadbalancer'
description 'load balancer'
run_list 'recipe[haproxy]'
```

Lab: What Can 'knife role' Do?

```
$ cd chef-repo
$ knife role --help
```

```
** ROLE COMMANDS **
knife role bulk delete REGEX (options)
knife role create ROLE (options)
knife role delete ROLE (options)
knife role edit ROLE (options)
knife role env_run_list add [ROLE] [ENVIRONMENT] [ENTRY[,ENTRY]] (options)
knife role env_run_list clear [ROLE] [ENVIRONMENT]
knife role env_run_list remove [ROLE] [ENVIRONMENT] [ENTRIES]
knife role env_run_list replace [ROLE] [ENVIRONMENT] [OLD_ENTRY] [NEW_ENTRY]
knife role env_run_list set [ROLE] [ENVIRONMENT] [ENTRIES]
knife role from file FILE [FILE..] (options)
```

Lab: Upload it to the Chef Server & verify

```
$ knife role from file loadbalancer.rb
```

```
Updated Role loadbalancer!
```

```
$ knife role list
```

```
loadbalancer
```


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Lab: View Details of the Role

```
$ knife role show loadbalancer
```

```
chef_type:            role
default_attributes:
description:          load balancer
env_run_lists:
json_class:           Chef::Role
name:                 loadbalancer
override_attributes:
run_list:             recipe[haproxy]
```

Lab: Set the loadbalancer role to node3

```
$ knife node run_list set node3 "role[loadbalancer]"
```

```
node3:
  run_list: role[loadbalancer]
```

Lab: Verify the Run List

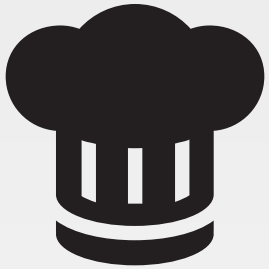
```
$ knife node show node3
```

```
Node Name:   node3
Environment: _default
FQDN:        ip-172-31-29-217.ec2.internal
IP:          54.88.169.195
Run List:    role[loadbalancer]
Roles:
Recipes:     haproxy::default
Platform:    centos 6.7
Tags:
```

Lab: Converge All the load balancer Nodes

```
$ knife ssh "role:loadbalancer" -x USER -P PWD "sudo chef-client"
```

```
ec2-54-88-169-195.compute-1.amazonaws.com Starting Chef Client, version 12.4.4
ec2-54-88-169-195.compute-1.amazonaws.com resolving cookbooks for run list:
["haproxy"]
ec2-54-88-169-195.compute-1.amazonaws.com Synchronizing Cookbooks:
ec2-54-88-169-195.compute-1.amazonaws.com   - haproxy
ec2-54-88-169-195.compute-1.amazonaws.com   - apache
ec2-54-88-169-195.compute-1.amazonaws.com Compiling Cookbooks...
ec2-54-88-169-195.compute-1.amazonaws.com Converging 3 resources
ec2-54-88-169-195.compute-1.amazonaws.com Recipe: haproxy::default
ec2-54-88-169-195.compute-1.amazonaws.com   * yum_package[haproxy] action install
(up to date)
...
```



Roles for Everyone

We will give our nodes a role to better describe them and so we can configure them in a similar manner.

Objective:

- ✓ Give our loadbalancer node a "loadbalancer" Role
- ❑ Give our web nodes a "web" Role

Lab: Define a Web Role

- ❑ Create a role named 'web' that has the run list 'recipe[apache]'
- ❑ Set node1's run list to be "role[web]"
- ❑ Set node2's run list to be "role[web]"

Lab: Create the web.rb File

```
chef-repo/roles/web.rb
```

```
name 'web'
description 'Web Server'
run_list 'recipe[apache]'
```

DISCUSSION

Role Attributes

If an attribute is set in a cookbook, and is also set in a role, then the role value wins!

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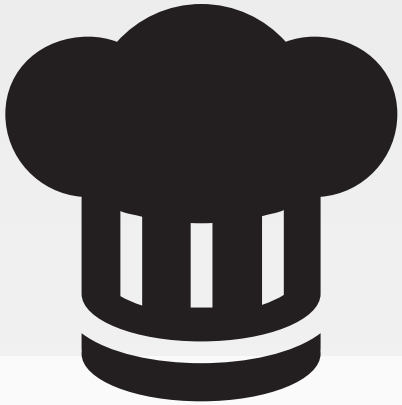
Lab: Role Attributes



Lets set apache to listen on tcp/8181 instead of tcp/8080 via the role

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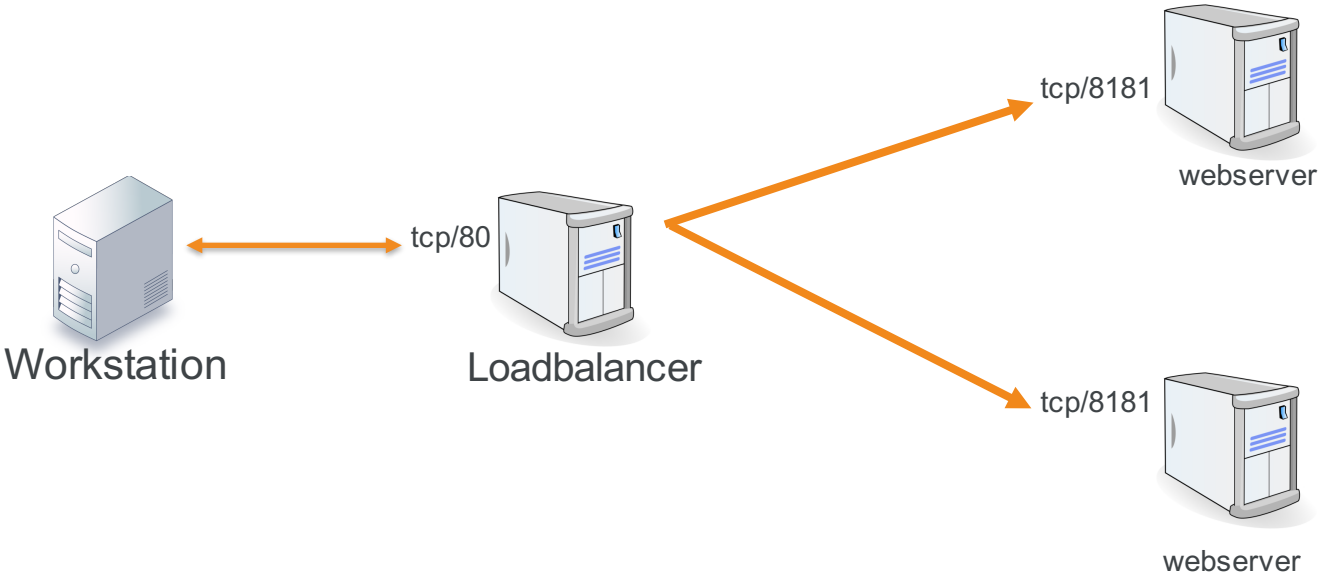
Our new topology



Lab: Create the web.rb File

chef-repo/roles/web.rb

```
name 'web'
description 'Web Server'
run_list 'recipe[apache]'
default_attributes({
  "apache" => {
        "port" => 8181
      }
})
```

Lab: Upload it to the Chef Server & verify

```
$ knife role from file web.rb
```

```
Updated Role web!
```

```
$ knife role list
```

```
loadbalancer
web
```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Lab: Verify Specific Information About the Role

```
$ knife role show web
```

```
chef_type:            role
default_attributes:
  apache:
    port: 8181
description:          Web Server
env_run_lists:
json_class:           Chef::Role
name:                 web
override_attributes:
run_list:             recipe[apache]
```

Lab: Set Run List on node1 and node2

```
$ knife node run_list set node1 "role[web]"
```

```
node1:
  run_list: role[web]
```

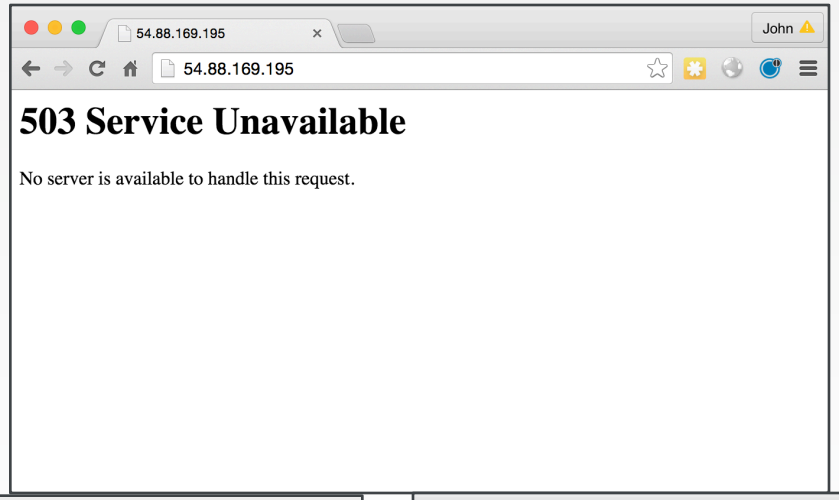
```
$ knife node run_list set node2 "role[web]"
```

```
node2:
  run_list: role[web]
```

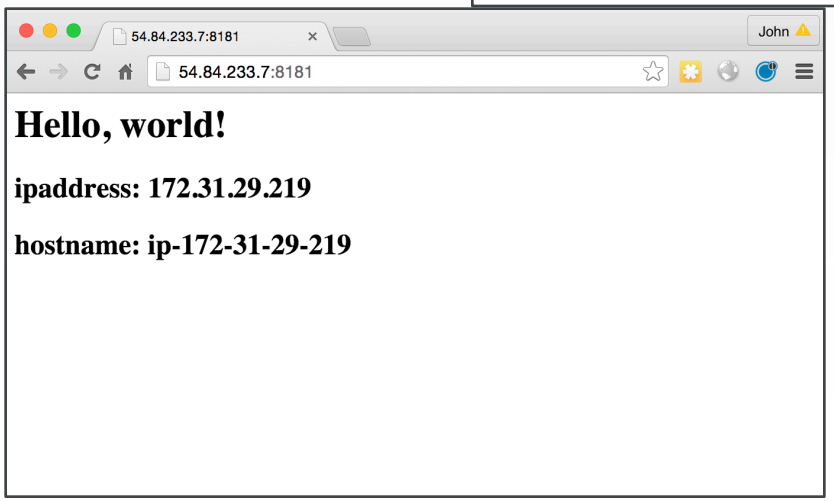
Lab: Converge All Web Nodes

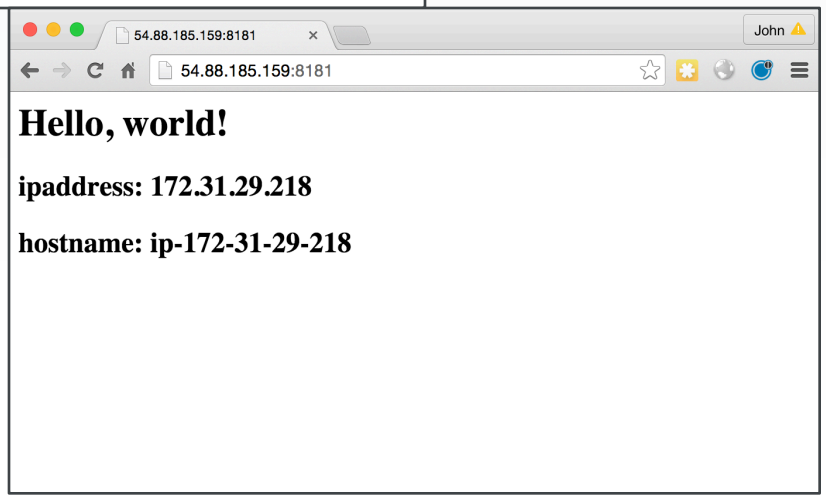
```
$ knife ssh "role:web" -x USER -P PWD "sudo chef-client"
```

```
ec2-54-84-233-7.compute-1.amazonaws.com       - restart service service[httpd]
ec2-54-84-233-7.compute-1.amazonaws.com
ec2-54-84-233-7.compute-1.amazonaws.com   Running handlers:
ec2-54-84-233-7.compute-1.amazonaws.com   Running handlers complete
ec2-54-84-233-7.compute-1.amazonaws.com   Chef Client finished, 2/6 resources
updated in 9.758669459 seconds
ec2-54-88-185-159.compute-1.amazonaws.com   * service[httpd] action restart
ec2-54-88-185-159.compute-1.amazonaws.com     - restart service service[httpd]
ec2-54-88-185-159.compute-1.amazonaws.com
ec2-54-88-185-159.compute-1.amazonaws.com Running handlers:
ec2-54-88-185-159.compute-1.amazonaws.com Running handlers complete
ec2-54-88-185-159.compute-1.amazonaws.com Chef Client finished, 2/6 resources
updated in 10.349332394 seconds
```



We still need to configure our load balancer to pick up new apache port (tcp/8181)





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Lab: Create the proxy.rb

chef-repo/roles/loadbalancer.rb

```
name 'loadbalancer'
description 'load balancer'
run_list 'recipe[haproxy]'
default_attributes({
  "apache" => {
        "port" => 8181
      }
})
```

Lab: Upload it to the Chef Server

```
$ knife role from file loadbalancer.rb
```

```
Updated Role loadbalancer!
```


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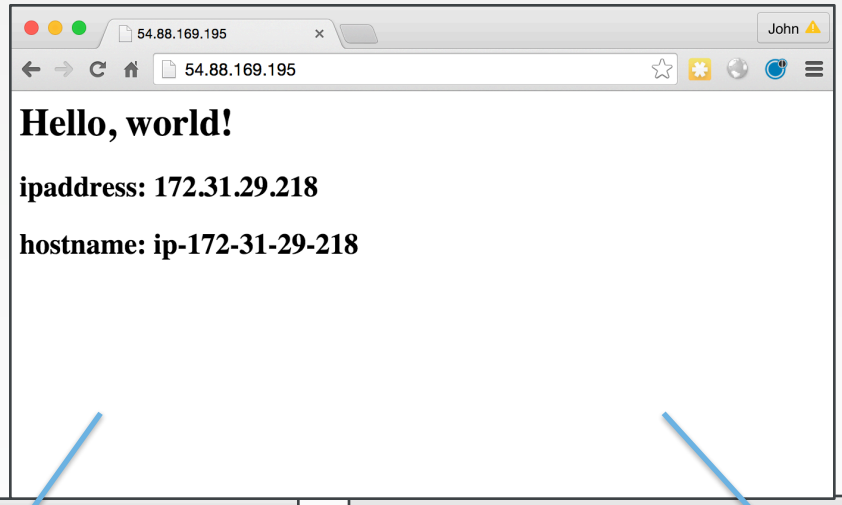
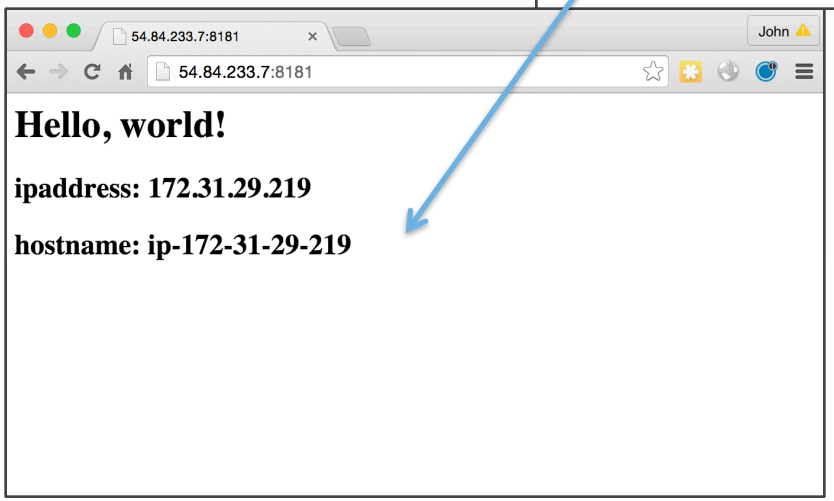
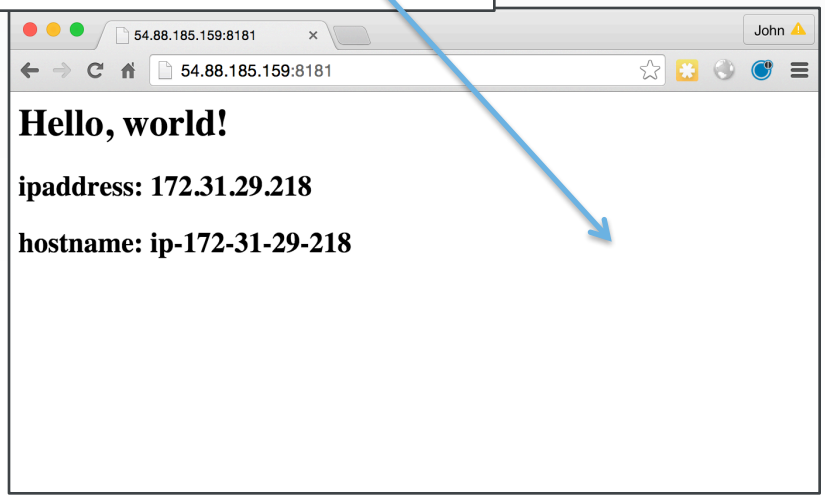
Lab: Converge Load Balancer node

```
$ knife ssh "role:loadbalancer" -x USER -P PWD "sudo chef-client"
```

```
ec2-54-88-169-195.compute-1.amazonaws.com     -    server app1 54.84.233.7:8080 weight 1
maxconn 100 check
ec2-54-88-169-195.compute-1.amazonaws.com     +    server app0 54.88.185.159:8181 weight 1
maxconn 100 check
ec2-54-88-169-195.compute-1.amazonaws.com     +    server app1 54.84.233.7:8181 weight 1
maxconn 100 check
ec2-54-88-169-195.compute-1.amazonaws.com   * service[haproxy] action start (up to date)
ec2-54-88-169-195.compute-1.amazonaws.com   * service[haproxy] action enable (up to date)
ec2-54-88-169-195.compute-1.amazonaws.com   * service[haproxy] action restart
ec2-54-88-169-195.compute-1.amazonaws.com     - restart service service[haproxy]
ec2-54-88-169-195.compute-1.amazonaws.com
ec2-54-88-169-195.compute-1.amazonaws.com Running handlers:
ec2-54-88-169-195.compute-1.amazonaws.com Running handlers complete
ec2-54-88-169-195.compute-1.amazonaws.com Chef Client finished, 2/5 resources updated in
9.831407575 seconds
```


54.88.169.195
John
54.88.169.195
Hello, world!
ipaddress: 172.31.29.218
hostname: ip-172-31-29-218


54.84.233.7:8181
John
54.84.233.7:8181
Hello, world!
ipaddress: 172.31.29.219
hostname: ip-172-31-29-219


54.88.185.159:8181
John
54.88.185.159:8181
Hello, world!
ipaddress: 172.31.29.218
hostname: ip-172-31-29-218

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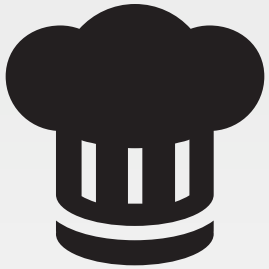


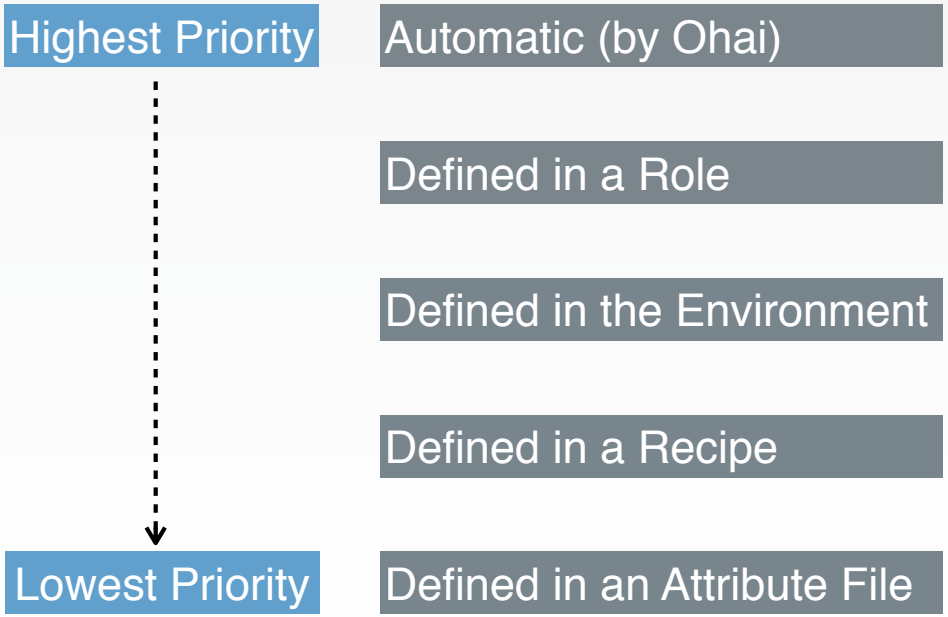
Roles for Everyone

We will give our nodes a role to better describe them and so we can configure them in a similar manner.

Objective:

- ✓ Give our loadbalancer node a "loadbalancer" Role
- ✓ Give our web nodes a "web" Role

Default Attribute Precedence



Please note this is a simplified diagram, and the precedence shown can be overridden

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DISCUSSION

Discussion

What are the benefits of using roles? What are the drawbacks?

Roles can contain roles. How many of these nested roles would make sense?

Roles are not version controlled – can you think of another way around this?

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DISCUSSION

Q&A

What questions can we help you answer?

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