Workstation Setup

Install Chef - http://www.getchef.com/chef/install

Get Chef - http://www.getchef.com

```
$ curl -L http://www.getchef.com/chef/install.sh | sudo bash
$ cd chef-repo
$ ls -al
$ ls .chef
```

chef-repo/.chef/knife.rb

```
current_dir = File.dirname(__FILE__)
log_level                :info
log_location             STDOUT
node_name                "USERNAME"
client_key               "#{current_dir}/USERNAME.pem"
validation_client_name "ORGNAME-validator"
validation_key           "#{current_dir}/ORGNAME-validator.pem"
chef_server_url      "https://api.opscode.com/organizations/ORGNAME"
cache_type               'BasicFile'
cache_options( :path =>"#{ENV['HOME']}/.chef/checksums" )
cookbook_path            ["#{current_dir}/../cookbooks"]
```

```
$ knife --version
$ knife client list
$ knife help list
```

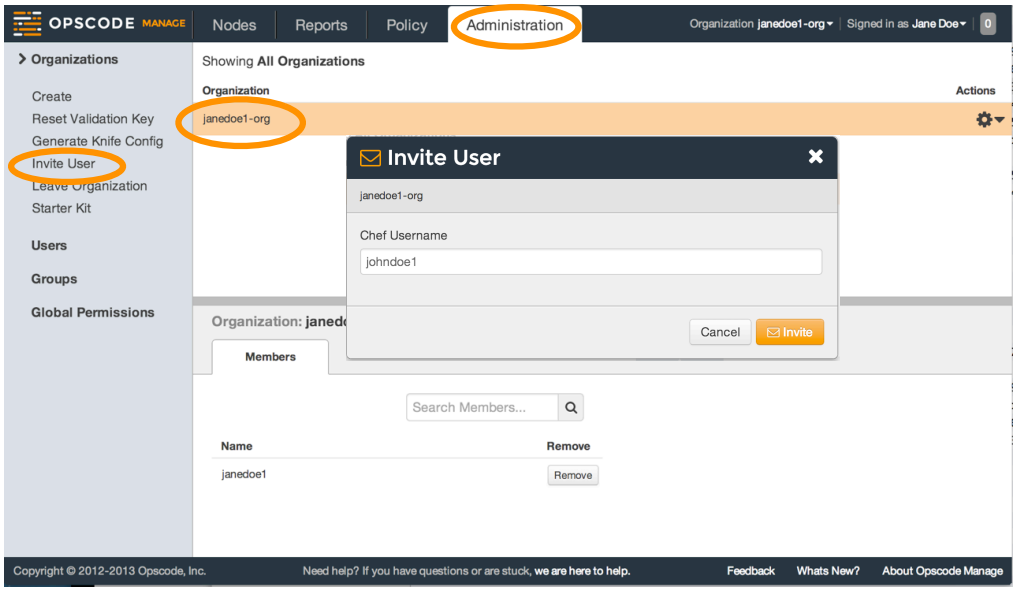
Organization Setup

Click the "Administration" tab,

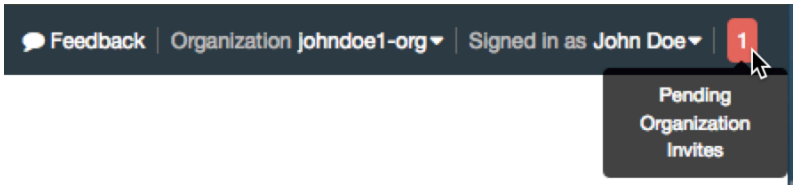
Select the appropriate Organization

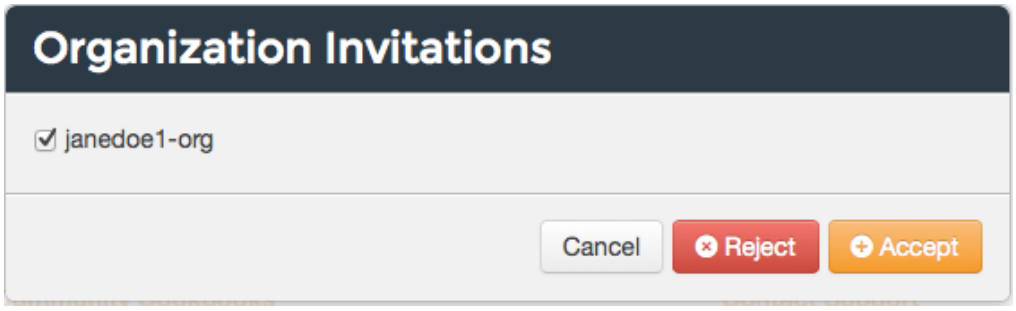
Click "Invite User" from the left menu

Enter your classmate's 'Chef Username' and click Invite

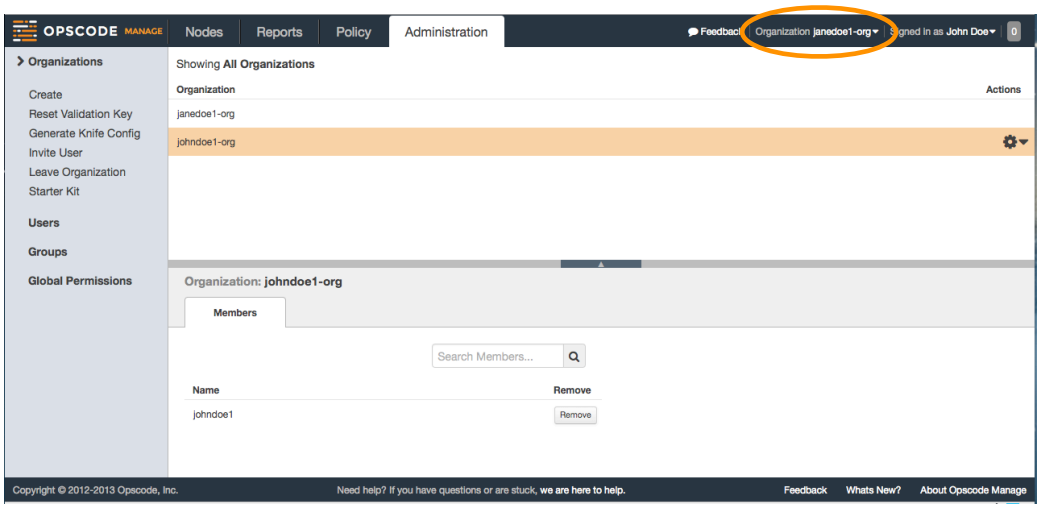


Click the notification, select the Organization and click 'Accept'

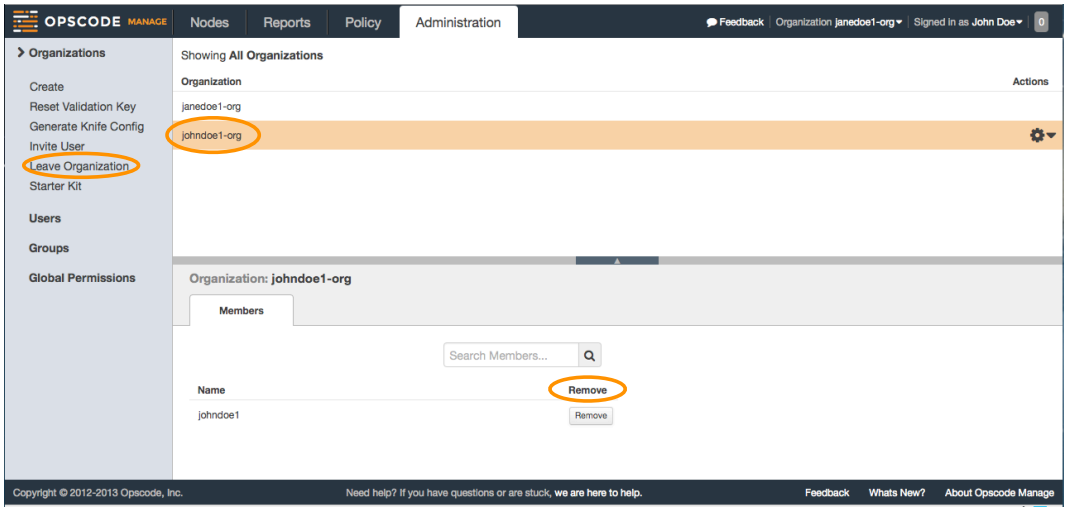




Select your classmate's organization from the drop down list and peruse their org



Now either 'Leave Organization' you've been invited into, or remove your classmate from your organization

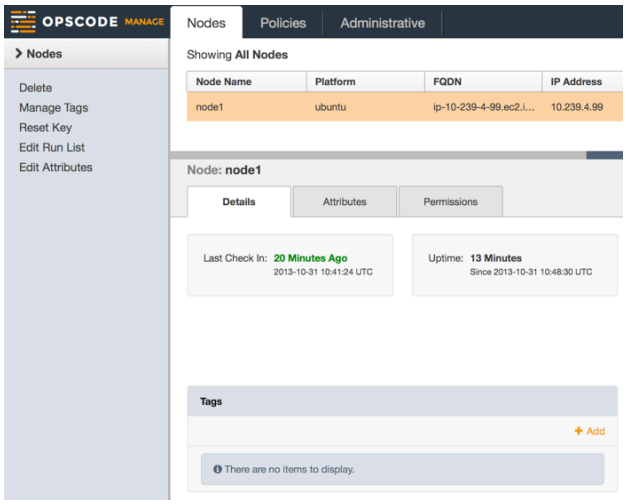


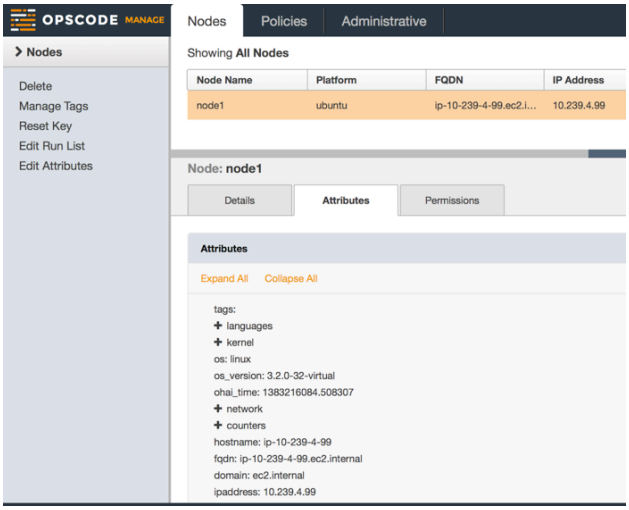
Node Setup

```
$ knife bootstrap <EXTERNAL_ADDRESS> --sudo -x chef -P chef -N
"node1"
$ ssh chef@IPADDRESS
chef@node1:~$ ls /etc/chef
chef@node1:~$ which chef-client
chef@node1:~$ cat /etc/chef/client.rb
chef@node1:~$ sudo vi /etc/chef/client.rb
```

Set `log_level` to `:info`

View Node on Chef Server





Chef Resources and Recipes

```
$ knife cookbook create apache
$ ls -la cookbooks/apache
```

cookbooks/apache/recipes/default.rb

```
package "httpd" do
  action :install
end

service "httpd" do
  action [ :enable, :start ]
end

cookbook_file "/var/www/html/index.html" do
  source "index.html"
  mode "0644"
end
```

cookbooks/apache/files/default/index.html

```
<html>
<body>
  <h1>Hello, world!</h1>
</body>
</html>
```

```
$ knife cookbook upload apache
$ knife node run_list add node1 "recipe[apache]"
chef@node1:~$ sudo chef-client
```

Introducing the Node Object

```
$ knife node list
$ knife client list
$ knife node show node1
chef@node1:~$ sudo ohai | less
$ knife node show node1 -l
$ knife node show node1 -Fj
$ knife node show node1 -a fqdn
$ knife search node "*:*" -a fqdn
```

Node Attributes

cookbooks/apache/attributes/default.rb

```
default["apache"]["indexfile"] = "index1.html"
```

cookbooks/apache/files/default/index1.html

```
<html>
 <body>
  <h1>Hello, world!</h1>
   <h2>This is index1.html</h2>
    <p>We configured this in the attributes file</p>
 </body>
</html>
```

cookbooks/apache/recipes/default.rb

```
cookbook_file "/var/www/html/index.html" do
  source node["apache"]["indexfile"]
  mode "0644"
end
```

```
$ knife cookbook upload apache
chef@node1:~$ sudo chef-client
```

cookbooks/apache/recipes/default.rb

```
node.default["apache"]["indexfile"] = "index2.html"
cookbook_file "/var/www/html/index.html" do
  source node["apache"]["indexfile"]
  mode "0644"
end
```

cookbooks/apache/files/default/index2.html

```
<html>
 <body>
  <h1>Hello, world!</h1>
   <h2>This is index2.html</h2>
    <p>We configured this in the recipe</p>
 </body>
</html>

$ knife cookbook upload apache
chef@node1:~$ sudo chef-client
```

Attributes, Templates, and Cookbook Dependencies

Use knife to create a cookbook called 'motd' (command hidden)

cookbooks/motd/attributes/default.rb

```
default["motd"]["company"] = "Chef"
```

Add template resource to the motd cookbook's default recipe (cookbooks/motd/recipes/default.rb) for /etc/motd based on the source 'motd.erb'. (command hidden)

cookbooks/motd/templates/default/motd.erb

```
This server is property of <%= node["motd"]["company"] %>
 <% if node["pci"]["in_scope"] -%>
 This server is in-scope for PCI compliance
 <% end -%>
```

Use knife upload the 'motd' cookbook (command hidden)

Use knife to create a cookbook called 'pci' (command hidden)

cookbooks/pci/attributes/default.rb

```
default["pci"]["in_scope"] = true
```

Use knife upload the 'pci' cookbook (command hidden)

Use knife add 'recipe[motd]' to node1's run list (command hidden)

```
$ knife node show node1
chef@node1:~$ sudo chef-client
```

cookbooks/motd/metadata.rb

```
maintainer        "YOUR_COMPANY_NAME"
maintainer_email "YOUR_EMAIL"
license           "All rights reserved"
description       "Installs/Configures motd"
long_description IO.read(File.join(File.dirname(__FILE__),
'README.md'))
version           "0.1.0"
depends "pci"
```

Use knife upload the 'motd' cookbook (command hidden)
Rerun 'chef-client' on node1 (command hidden)

```
chef@node1:~$ cat /etc/motd
$ knife search node "pci:*" -a pci
```

cookbooks/pci/attributes/default.rb

```
default["pci"]["in_scope"] = false
```

Use knife upload the 'pci' cookbook (command hidden)

Rerun 'chef-client' on node1 (command hidden)

```
chef@node1:~$ cat /etc/motd
$ knife node show node1 -a pci
```

Template Variables, Notifications, and Controlling Idempotency

cookbooks/apache/metadata.rb

```
maintainer       "YOUR_COMPANY_NAME"
maintainer_email "YOUR_EMAIL"
license          "All rights reserved"
description      "Installs/Configures apache"
long_description IO.read(File.join(File.dirname(__FILE__),
'README.md'))
version          "0.2.0"
```

cookbooks/apache/attributes/default.rb

```
default["apache"]["sites"]["clowns"] = { "port" => 80 }
default["apache"]["sites"]["bears"] = { "port" => 81 }
```

cookbooks/apache/recipes/default.rb

(See https://gist.github.com/6781185)

```
package "httpd" do
  action :install
end

service "httpd" do
  action [ :enable, :start ]
end

execute "mv /etc/httpd/conf.d/welcome.conf
/etc/httpd/conf.d/welcome.conf.disabled" do
  only_if do
    File.exist?("/etc/httpd/conf.d/welcome.conf")
  end
  notifies :restart, "service[httpd]"
end

node["apache"]["sites"].each do |site_name, site_data|
  document_root = "/srv/apache/#{site_name}"

  template "/etc/httpd/conf.d/#{site_name}.conf" do
   source "custom.erb"
   mode "0644"
   variables(:document_root => document_root,:port => site_data["port"])
   notifies :restart, "service[httpd]"
  end

  directory document_root do
   mode "0755"
   recursive true
  end

  template "#{document_root}/index.html" do
   source "index.html.erb"
   mode "0644"
   variables(:site_name => site_name, :port => site_data["port"])
  end
end
```

cookbooks/apache/templates/default/custom.erb
(See https://gist.github.com/8955103)

```
<% if @port != 80 -%>
  Listen <%= @port %>
<% end -%>

<VirtualHost *:<%= @port %>>
  ServerAdmin webmaster@localhost

  DocumentRoot <%= @document_root %>
  <Directory />
     Options FollowSymLinks
     AllowOverride None
  </Directory>
  <Directory <%= @document_root %>
     Options Indexes FollowSymLinks MultiViews
     AllowOverride None
     Order allow,deny
     allow from all
     </Directory>
</VirtualHost>
```

cookbooks/apache/templates/default/index.html.erb
(See https://gist.github.com/2866421)

```
<html>
  <body>
    <h1>Welcome to <%= node["motd"]["company"] %></h1>
    <h2>We love <%= @site_name %></h2>
    <%= node["ipaddress"] %>:<%= @port %>
  </body>
</html>
```

Use knife upload the 'apache' cookbook (command hidden)
Rerun 'chef-client' on node1 (command hidden)

Troubleshoot the failure

Search

```
$ knife search node "*:*"
$ knife search node "ipaddress:10.*"
$ knife search node "*:*" -a ipaddress
$ knife search node "ipaddress:10.*" -a ipaddress
$ knife search node "ipaddress:10* AND platform:centos"
$ knife search node "ipaddress:[10.0.* TO 10.2.*]"
```

cookbooks/apache/recipes/ip-logger.rb

```
search("node","platform:centos").each do |server|
  log "The CentOS servers in your organization have the following
  FQDN/IP Addresses:- #{server["fqdn"]}/#{server["ipaddress"]}"
end
```

Use knife upload the 'apache' cookbook (command hidden)
Add the recipe ' apache::ip-logger' to node1's run list (command hidden)
Rerun 'chef-client' on node1 (command hidden)

Remove the recipe ' apache::ip-logger' from node1's run list (command hidden)

Recipe Inclusion, Data Bags, and Search

```
$ mkdir -p data_bags/users
$ knife data_bag create users
```

data_bags/users/bobo.json

```
{
  "id": "bobo",
  "comment": "Bobo T. Clown",
  "uid": 2000,
  "gid": 0,
  "home": "/home/bobo",
  "shell": "/bin/bash"
}
```

```
$ knife data_bag from file users bobo.json
```

Create another user in the users data bag called 'frank' (command hidden)

```
{
  "id": "frank",
  "comment": "Frank Belson",
  "uid": 2001,
  "gid": 0,
  "home": "/home/frank",
  "shell": "/bin/bash"
}
```

Use knife to upload frank's data_bag item(command hidden)

```
$ knife search users "*:*"
$ knife search users "id:bobo" -a shell
```

Create a data_bag called 'groups' (2 commands hidden)

data_bags/groups/clowns.json

```
{
  "id": "clowns",
  "gid": 3000,
  "members": [ "bobo", "frank" ]
}
```

Use knife to upload the 'clowns' data_bag item (command hidden)

Create a cookbook called 'users' (command hidden)

Edit the 'user' cookbook's default recipe and add the following

```
search(:users, "*:*").each do |user_data|
  user user_data["id"] do
    comment user_data["comment"]
    uid user_data["uid"]
    gid user_data["gid"]
    home user_data["home"]
    shell user_data["shell"]
  end
end
include_recipe "users::groups"
```

cookbooks/users/recipes/groups.rb

```
search(:groups, "*:*").each do |group_data|
  group group_data["id"] do
    gid group_data["gid"]
    members group_data["members"]
  end
end
```

Upload the 'users' cookbook (command hidden)
Use knife to add the 'users' cookbook's default receipt to node1's run list (command hidden)
Rerun 'chef-client' on node1 (command hidden)

```
chef@node1:~$ cat /etc/passwd
chef@node1:~$ cat /etc/group
```

Roles

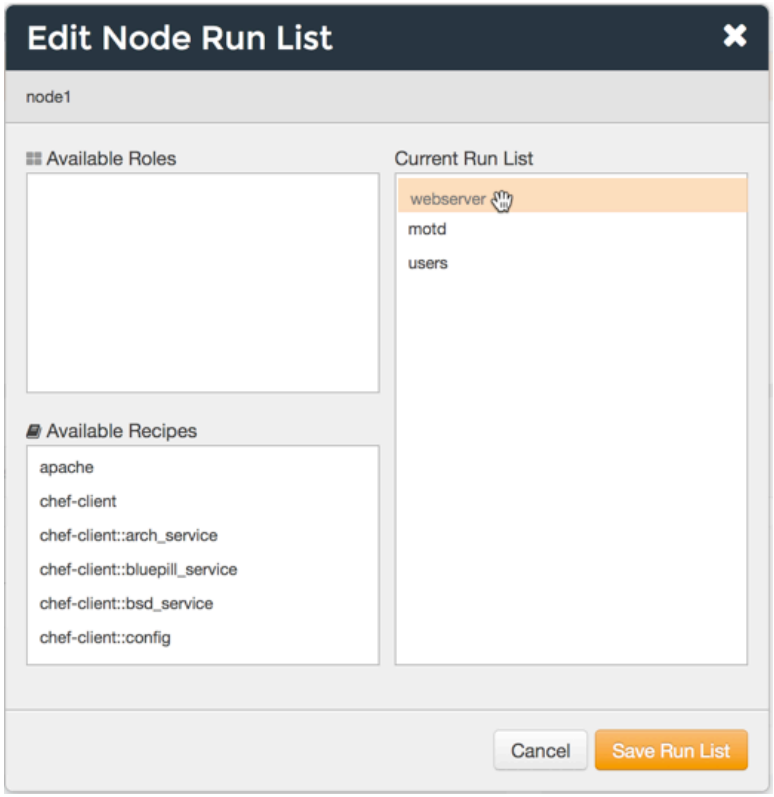
roles/webserver.rb

```
name "webserver"
description "Web Server"
run_list "recipe[apache]"
default_attributes({
  "apache" => {
    "sites" => {
      "admin" => {
        "port" => 8000
      }
    }
  }
})
```

```
$ knife role from file webserver.rb
$ knife role show webserver
```

Use knife to search for roles that have the apache cookbook's default recipe in its run_list (command hidden)

Replace recipe[apache] with role[webserver] in run list




```
chef@node1:~$ sudo chef-client
$ knife search node "role:webserver" -a apache.sites
```

roles/webserver.rb

```
name "webserver"
description "Web Server"
run_list "recipe[apache]"
default_attributes({
  "apache" => {
    "sites" => {
      "admin" => {
        "port" => 8000
      },
      "bears" => {
        "port" => 8081
      }
    }
  }
})
```

Use knife to upload this webserver role & rerun chef-client (commands hidden)
Use knife to Display the 'apache.sites' attribute on all nodes with webserver role (command hidden)
Edit the 'base' role (command hidden)

```
name "base"
description "Base Server Role"
run_list "recipe[motd]", "recipe[users]"
```

Upload the 'base' role to Chef server (command hidden)
Edit the 'webserver' role (command hidden)

```
name "webserver"
description "Web Server"
run_list "role[base]", "recipe[apache]"
default_attributes({
  "apache" => {
    "sites" => {
      "admin" => {
        "port" => 8000
      },
      "bears" => {
        "port" => 8081
      }
    }
  }
})
```

Upload the 'webserver' role to Chef server (command hidden)
Rerun 'chef-client' on node1 (command hidden)

Environments

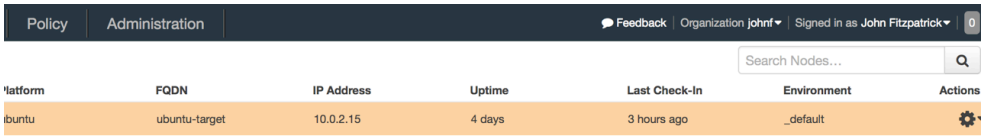
```
$ knife cookbook show apache
$ knife environment list
$ mkdir environments
```

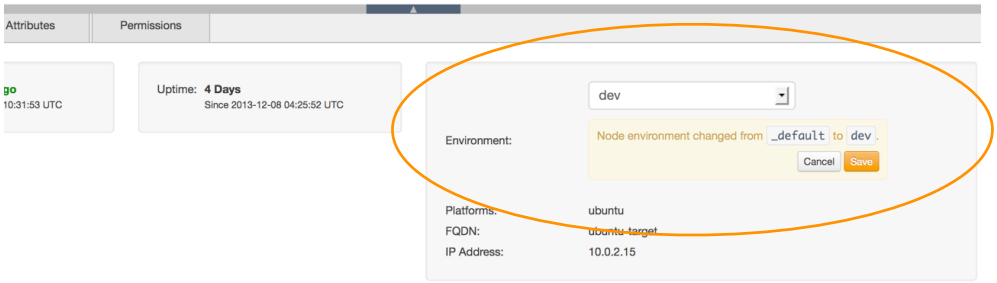
environments/dev.rb

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

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

Use the UI to change your node's environment to "dev"





Rerun 'chef-client' on node1 (command hidden)

environments/production.rb

```
name "production"
description "For Prods!"
cookbook "apache", "= 0.1.0"
override_attributes({
 "pci" => {
   "in_scope" => true
 }
})
```

Use knife to upload this production environment (command hidden)
Use the UI to change your node's environment to "production" (Screenshot hidden)
Rerun 'chef-client' on node1 (command hidden)

Using Community Cookbooks

```
$ knife cookbook site search chef-client
$ knife cookbook site show chef-client
$ knife cookbook site download chef-client
$ tar -zxvf chef-client*.tar.gz -C cookbooks/
```

cookbooks/chef-client/recipes/delete_validation.rb

```
unless chef_server?
  file Chef::Config[:validation_key] do
    action :delete
    backup false
    only_if { ::File.exists?(Chef::Config[:client_key]) }
  end
end
```

roles/base.rb

```
name "base"
description "Base Server Role"
run_list "recipe[chef-client::delete_validation]", "recipe[motd]",
"recipe[users]"
```

cookbooks/chef-client/recipes/default.rb

```
include_recipe "chef-client::service"
```

cookbooks/chef-client/recipes/service.rb

```
supported_init_styles = [
  'arch',
  'bluepill',
  'bsd',
  'daemontools',
  'init',
  'launchd',
  'runit',
  'smf',
  'upstart',
  'winsw'
]
init_style = node["chef_client"]["init_style"]

# Services moved to recipes
if supported_init_styles.include? init_style
  include_recipe "chef-client::#{init_style}_service"
else
  log "Could not determine service init style, manual intervention
required to start up the chef-client service."
end
```

Use knife to upload the 'chef-client' cookbook (command hidden)
Use knife to download the 'cron' cookbook (command hidden)
untar the 'cron' cookbook into the cookbooks directory (command hidden)
Use knife to upload the 'cron' cookbook (command hidden)
Use knife to upload the 'chef-client' cookbook (command hidden)
Use knife to download the 'logrotate' cookbook (command hidden)
untar the 'logrotate' cookbook into the cookbooks directory (command hidden)
Use knife to upload the 'logrotate' cookbook (command hidden)
Use knife to upload the 'chef-client' cookbook (command hidden)

Edit the 'base' role (command hidden)

```
name "base"
description "Base Server Role"
run_list "recipe[chef-client::delete_validation]", "recipe[chef-client]", "recipe[motd]", "recipe[users]"
```

Upload the 'base' role to Chef server (command hidden)Rerun 'chef-client' on node1 (command hidden)
Check the 'chef-cllient' service is running (command hidden)Use knife to download the 'ntp' cookbook (command hidden)
untar the 'ntp' cookbook into the cookbooks directory (command hidden)
Use knife to upload the 'ntp' cookbook (command hidden)

Edit the 'base' role (command hidden)

```
name "base"
description "Base Server Role"
run_list "recipe[chef-client::delete_validation]", "recipe[chef-client]", "recipe[ntp]", "recipe[motd]", "recipe[users]"
```

Upload the 'base' role to Chef server (command hidden)

Just Enough Ruby for Chef

Bonus Exercises

Exercise #1

Situation:

You need to learn more Ruby because you want to be a Chef ninja.

Tasks:

- Sign up for an account on codeacademy.com and start doing the exercises in the Ruby track. http://www.codecademy.com/tracks/ruby