



Templates

Desired State vs Data

Objectives



After completing this module, you should be able to:

- Explain when to use a template resource
- Create a template file
- Use ERB tags to display node data in a template
- Define a template resource



Cleaner Recipes

In the last section we updated our webserver cookbook to display information about our node.

We added this content to the file resource in the server recipe.

Demo: The 'myiis' Server Recipe

~\cookbooks\myiis\recipes\server.rb

```
powershell_script 'Install IIS' do
  code 'Add-WindowsFeature Web-Server'
end

file 'C:\inetpub\wwwroot\Default.htm'
  content "<h1>Hello, world!</h1>
<h2>ipaddress: #{node['ipaddress']}</h2>
<h2>hostname: #{node['hostname']}</h2>
<h2>total memory: #{node['memory']['total']}
```

Double Quotes Close Double Quotes



Double quoted strings are terminated by double quotes.

```
"<h1 style="color: red;">Hello, World!</h1>"
```



CONCEPT



Backslash

We can use double-quotes as long as we prefix them with a backslash.

```
"<h1 style=\"color: red;\">"Hello, World!</h1>"
```





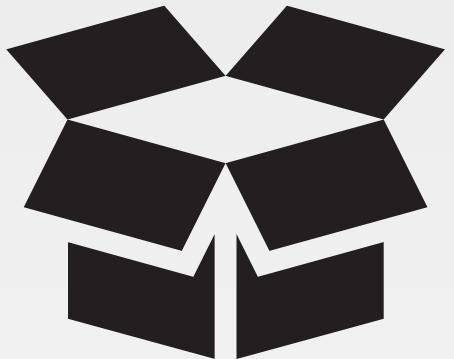
Backslash

Backslashes are reserved characters. So to use them you need to use a backslash.

```
"Root Path: C:\\"
```



CONCEPT



Backslash

Backslashes are reserved characters. So to use them you need to use a backslash.

```
"Root Path: c:\\\"
```

Unexpected Formatting

```
file 'C:\example.txt' do
  content 'This is the first line of the file.
    This is the second line. If I try and line it up...'
```

Don't even think about pasting ASCII ART in here!

```
'  
end
```

This is the first line of the file.

This is the second line. If I try and line
it up...

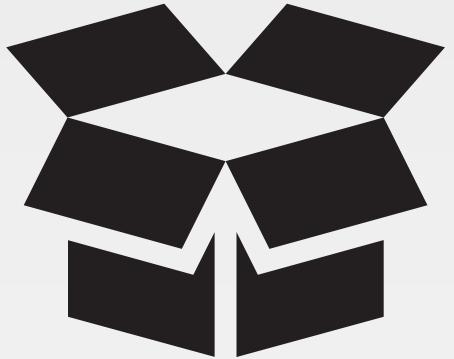
Don't even think about pasting ASCII ART in here!



Copy Paste

This process is definitely error prone. Especially because a human has to edit the file again before it is deployed.

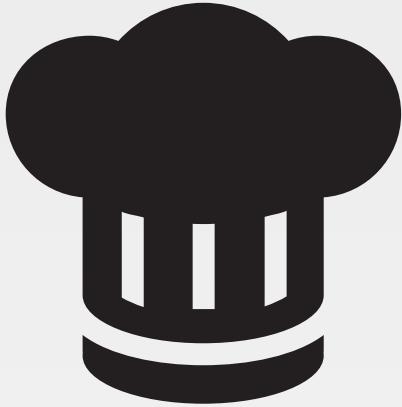
CONCEPT



What We Need

We need the ability to store the data in another file, which is in the native format of the file we are writing out but that still allows us to insert ruby code...

...specifically, the node attributes we have defined.



GL: Cleaner Recipes

Adding the node attributes to our recipes did make it harder to read.

Objective:

- Decide which resource will help us address this issue



GL: Let's Check the Docs...

Use the `file` resource to manage files directly on a node.

Use the **`cookbook_file`** resource to copy a file from a cookbook's `/files` directory. Use the **`template`** resource to create a file based on a template in a cookbook's `/templates` directory. And use the **`remote_file`** resource to transfer a file to a node from a remote location.

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



GL: remote_file

Use the **remote_file** resource to transfer a file from a remote location using file specificity. This resource is similar to the file resource.

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



GL: **cookbook_file**

Use the **cookbook_file** resource to transfer files from a sub-directory of COOKBOOK_NAME\files\ to a specified path located on a host that is running the chef-client.

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

Demo: cookbook_file's Source Match Up

```
> tree /f cookbooks\myiis\files\default
Folder PATH listing
Volume serial number is B04A-119C
C:\USERS\ADMINISTRATOR\COOKBOOKS\myiis\FILES\DEFAULT
```

Default.htm

No subfolders exist

```
cookbook_file 'C:\inetpub\wwwroot\Default.htm' do
  source 'Default.htm'
end
```



Template

A cookbook template is an Embedded Ruby (ERB) template that is used to generate files. Templates may contain Ruby expressions and statements.

Use the template resource to add cookbook templates to recipes; place the corresponding Embedded Ruby (ERB) template in a cookbook's templates directory.

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

Demo: Template File's Source Matches Up

```
> tree /f cookbooks\myiis\templates\default
Folder PATH listing
Volume serial number is B04A-119C
C:\USERS\ADMINISTRATOR\COOKBOOKS\IIS\TEMPLATES
```

```
    Default.htm.erb
```

```
No subfolders exist
```

```
template 'C:\inetpub\wwwroot\Default.htm' do
  source 'Default.htm.erb'
end
```

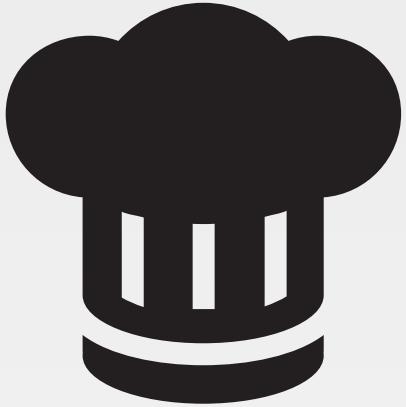


Template

To use a template, two things must happen:

1. A template resource must be added to a recipe
2. An Embedded Ruby (ERB) template must be added to a cookbook

https://docs.chef.io/resource_template.html#using-templates



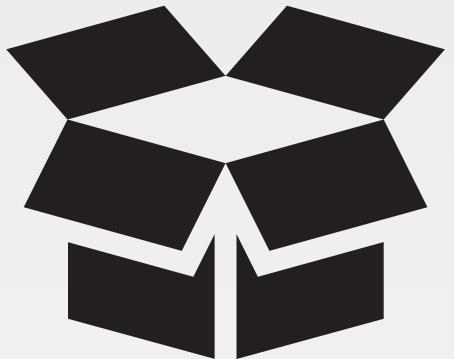
GL: Cleaner myiis Recipe

Adding the node attributes to the index page did make it harder to read the recipe.

Objective:

- Create a template with chef generate
- Define the contents of the ERB template
- Change the file resource to the template resource in the 'myiis' cookbook

CONCEPT



What is chef?

An executable program that allows you generate cookbooks and cookbook components.

GL: What Can chef Do?



```
> chef --help
```

Usage:

```
chef -h/--help  
chef -v/--version  
chef command [arguments...] [options...]
```

Available Commands:

exec	Runs the command in context of the embedded ruby
gem	Runs the `gem` command in context of the embedded ruby
generate	Generate a new app, cookbook, or component
shell-init	Initialize your shell to use ChefDK as your primary ruby
install	Install cookbooks from a Policyfile and generate a locked
cookbook set	

GL: What Can chef generate Do?



```
> chef generate --help
```

Usage: `chef generate GENERATOR [options]`

Available generators:

<code>app</code>	Generate an application repo
<code>cookbook</code>	Generate a single cookbook
<code>recipe</code>	Generate a new recipe
<code>attribute</code>	Generate an attributes file
<code>template</code>	Generate a file template
<code>file</code>	Generate a cookbook file
<code>lwrp</code>	Generate a lightweight resource/provider
<code>repo</code>	Generate a Chef policy repository
<code>policyfile</code>	Generate a Policyfile for use with the install/push commands (experimental)

GL: What Can chef generate template Do?



```
> chef generate template --help
```

Usage: chef generate template [path/to/cookbook] NAME [options]

-C, --copyright COPYRIGHT
to 'The Authors'

Name of the copyright holder - defaults

-m, --email EMAIL

Email address of the author - defaults to

...

-a, --generator-arg KEY=VALUE
VALUE in the

Use to set arbitrary attribute KEY to

-I, --license LICENSE
to

all_rights, mit, gplv2, gplv3 - defaults

-s, --source SOURCE_FILE

Copy content from SOURCE_FILE

-g GENERATOR_COOKBOOK_PATH,
code_generator

Use GENERATOR_COOKBOOK_PATH for the

--generator-cookbook

GL: Use chef to Generate a Template



```
> cd ~  
> chef generate template cookbooks\myiis Default.htm
```

```
Recipe: code_generator::template  
* directory[cookbooks/myiis/templates] action create  
  - create new directory cookbooks/myiis/templates  
* template[cookbooks/myiis/templates/Default.htm.erb] action create  
  - create new file cookbooks/myiis/templates/Default.htm.erb  
  - update content in file cookbooks/myiis/templates/Default.htm.erb from  
none to e3b0c4  
(diff output suppressed by config)
```

GL: Lets Look at the Template File



```
> tree /f cookbooks\myiis\templates
```

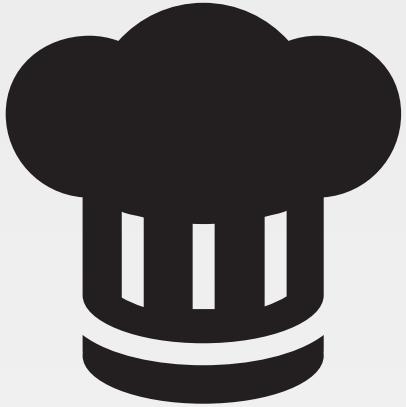
```
Folder PATH listing
```

```
Volume serial number is 2CB6-07DF
```

```
C:\USERS\ADMINISTRATOR\COOKBOOKS\MYIIS\TEMPLATES
```

```
    Default.htm.erb
```

```
No subfolders exist
```



Cleaner Recipes

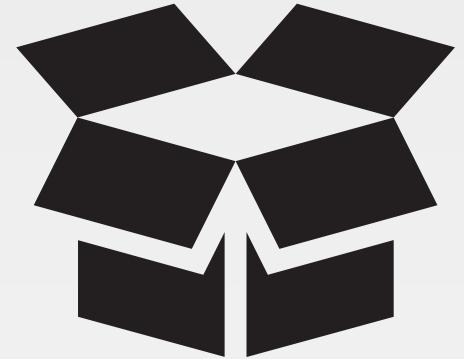
Adding the node attributes to the default page did make it harder to read the recipe.

Objective:

- ✓ Create a template with chef generate
- ❑ Define the contents of the ERB template
- ❑ Change the file resource to the template resource in the 'myiis' cookbook

CONCEPT

ERB



An Embedded Ruby (ERB) template allows Ruby code to be embedded inside a text file within specially formatted tags.

Ruby code can be embedded using expressions and statements.

<https://docs.chef.io/templates.html#variables>

Text Within an ERB Template

```
<% if (50 + 50) == 100 %>
50 + 50 = <%= 50 + 50 %>
<% else %>
At some point all of MATH I learned in school changed.
<% end %>
```

Each ERB tag has a beginning tag and a matched ending tag.

Text Within an ERB Template

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<% if (50 + 50) == 100 %>
50 + 50 = <%= 50 + 50 %>
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At some point all of MATH I learned in school changed.
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Text Within an ERB Template

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<% if (50 + 50) == 100 %>
```

```
50 + 50 = <%= 50 + 50 %>
```

```
<% else %>
```

At some point all of MATH I learned in school changed.

```
<% end %>
```

Each ERB tag has a beginning tag and a matched ending tag.

Text Within an ERB Template

```
<% if (50 + 50) == 100 %>
```

```
50 + 50 = <%= 50 + 50 %>
```

```
<% else %>
```

At some point all of MATH I learned in school changed.

```
<% end %>
```

Executes the ruby code within the brackets and do not display the result.

Text Within an ERB Template

```
<% if (50 + 50) == 100 %>
```

```
50 + 50 = <%= 50 + 50 %>
```

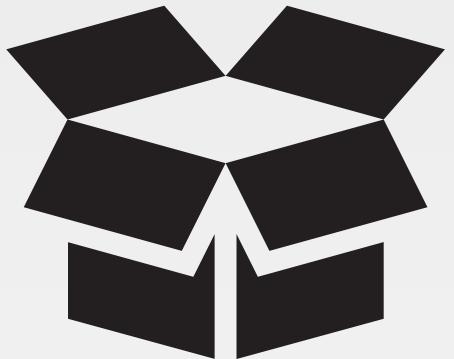
```
<% else %>
```

At some point all of MATH I learned in school changed.

```
<% end %>
```

Executes the ruby code within the brackets and display the results.

CONCEPT



The Angry Squid



GL: Move Our Source to the Template

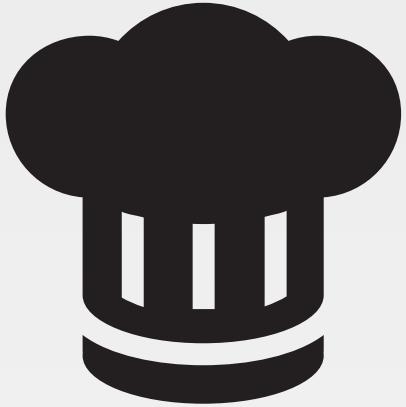
~\cookbooks\myiis\templates\Default.htm.erb

```
<html>
  <body>
    <h1>Hello, world!</h1>
    <h2>ipaddress: #{node['ipaddress']}</h2>
    <h2>hostname: #{node['hostname']}</h2>
    <h2>total memory: #{node['memory']['total']}</h2>
    <h2>CPU Mhz: #{node['cpu'][0]['mhz']}</h2>
  </body>
</html>
```

GL: Replace String Interpolation with ERB

~\cookbooks\myiis\templates\Default.htm.erb

```
<html>
  <body>
    <h1>Hello, world!</h1>
    <h2>ipaddress: <%= node['ipaddress'] %></h2>
    <h2>hostname: <%= node['hostname'] %></h2>
    <h2>total memory: <%= node['memory']['total'] %></h2>
    <h2>CPU Mhz: <%= node['cpu'][0]['mhz'] %></h2>
  </body>
</html>
```



Cleaner Recipes

Adding the node attributes to the default page did make it harder to read the recipe.

Objective:

- ✓ Create a template with chef generate
- ✓ Define the contents of the ERB template
- ❑ Change the file resource to the template resource in the 'myiis' cookbook

GL: Remove the Existing Content Attribute

~\cookbooks\myiis\recipes\server.rb

```
# ... POWERSHELL_SCRIPT RESOURCE ...

file 'c:\inetpub\wwwroot\Default.htm' do
  content "<h1>Hello, world!</h1>
<h2>ipaddress: #{node['ipaddress']}</h2>
<h2>hostname: #{node['hostname']}</h2>
<h2>total memory: #{node['memory']['total']}</h2>
<h2>CPU Mhz: #{node['cpu'][0]['mhz']}</h2>"
end

# ... SERVICE RESOURCE ...
```

GL: Change the File Resource to a Template

~\cookbooks\myiis\recipes\server.rb

```
# ... POWERSHELL_SCRIPT RESOURCE ...

template 'c:\inetpub\wwwroot\Default.htm' do
end

# ... SERVICE RESOURCE ...
```

What to Specify as the Source?

~\cookbooks\myiis\recipes\server.rb

```
# ... POWERSHELL_SCRIPT RESOURCE ...

template 'c:\inetpub\wwwroot\Default.htm' do
  source "????????????"
end

# ... SERVICE RESOURCE ...
```

GL: Viewing the Partial Path to the Template



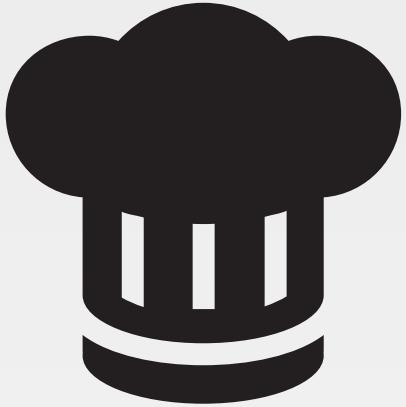
```
> tree /f cookbooks\myiis\templates
```

```
Folder PATH listing
Volume serial number is B04A-119C
C:\USERS\ADMINISTRATOR\COOKBOOKS\IIS\TEMPLATES
|
|   Default.htm.erb
|
└── default
```

GL: Change the File Resource to a Template

~\cookbooks\myiis\recipes\server.rb

```
template 'c:\inetpub\wwwroot\Default.htm' do
  source 'Default.htm.erb'
end
```



Cleaner Recipes

Adding the node attributes to the default page did make it harder to read the recipe.

Objective:

- ✓ Create a template with chef generate
- ✓ Define the contents of the ERB template
- ✓ Change the file resource to the template resource in the 'myiis' cookbook



Lab: Update the Version

- Use chef-client to apply the "myiis" cookbook's "default" recipe
- Update the "myiis" cookbook's version for this patch

Lab: Change Directories and Apply the Cookbook



```
> cd ~  
> chef-client --local-mode -r "recipe[myiis]"
```

```
Converging 3 resources  
Recipe: myiis::server  
  * powershell_script[Install IIS] action run  
    - execute "C:\Windows\system32\WindowsPowerShell\v1.0\powershell.exe" -NoLogo -  
NonInteractive -NoProfile -ExecutionPolicy Bypass -InputFormat Non  
e -File "C:/tmp/chef-script20180919-4012-19ov7v5.ps1"  
  * template[c:\inetpub\wwwroot\Default.htm] action create  
    - update content in file c:\inetpub\wwwroot\Default.htm from 38be49 to 163c45  
    --- c:\inetpub\wwwroot\Default.htm 2018-09-19 17:34:44.000000000 +0000  
    +++ c:\inetpub\wwwroot\chef-Default20180919-4012-2xoqf2.htm 2018-09-19  
17:57:27.000000000 +0000  
      @@ -1,6 +1,10 @@  
      -<h1>Hello, world!</h1>...
```

Lab: Update the Cookbook's Patch Number

~\cookbooks\myiis\metadata.rb

```
name          'myiis'  
maintainer    'The Authors'  
maintainer_email 'you@example.com'  
license        'all_rights'  
description    'Installs/Configures myiis'  
long_description 'Installs/Configures myiis'  
version        '0.2.1'
```



Lab: Update the Version

- ✓ Use chef-client to apply the "myiis" cookbook's "default" recipe
- ✓ Update the "myiis" cookbook's version for this patch

DISCUSSION



Discussion

What is the benefit of using a template over defining the content within a recipe? What are the drawbacks?

What do each of the ERB tags accomplish?

DISCUSSION



Q&A

What questions can we help you answer?

- Resources (file, cookbook_file, template, and remote_file)
- Templates
- ERB



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