Configuration Management

Creating Chef Cookbooks

Overview

- Chef
  - Overview
  - Architecture
  - Key Concepts
- Inspec
- Kitchen

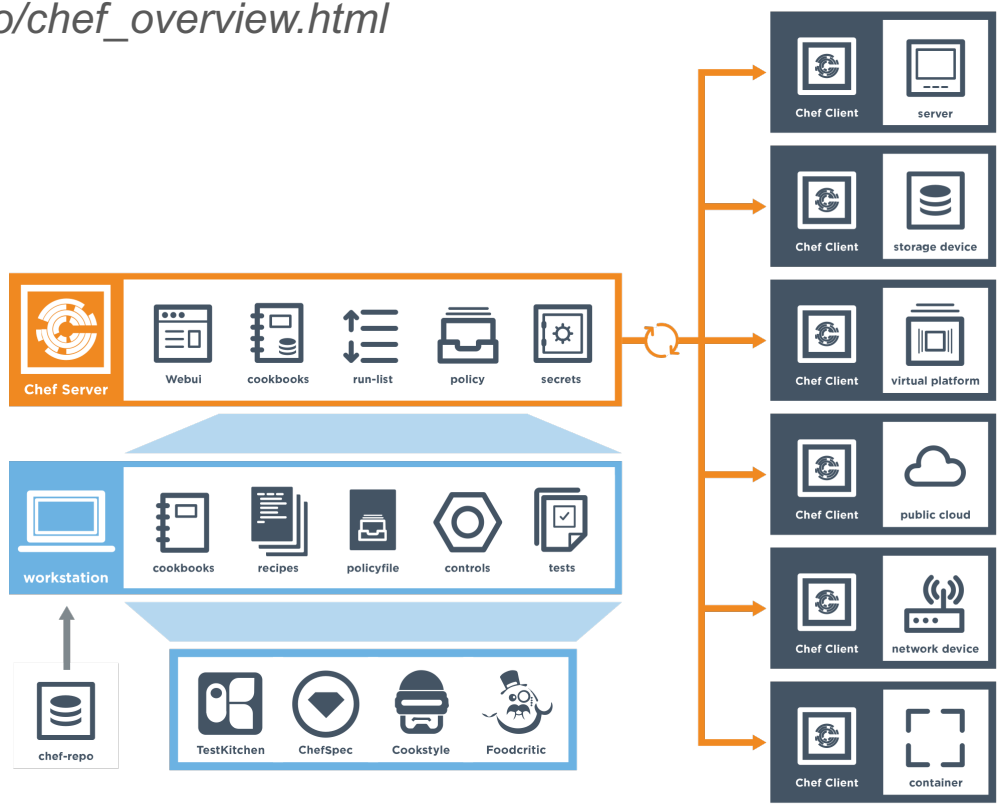
Chef - Overview

https://www.chef.io/

- Chef is an automation platform that allows you to configure and manage your infrastructure as code
- Key functionality
  - Idempotentency
  - Version control
  - Reproducibility

Chef - Architecture

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



Chef – Data Path

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

Chef – Key Concepts - Recipes

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

- A recipe is the most fundamental configuration element within the organization. A recipe:
  - Is authored using Ruby
  - Must define everything that is required to configure part of a system
  - Must be stored in a cookbook
  - May have a dependency on one (or more) recipes
  - Is always executed in the same order as listed in a run-list

Chef – Key Concepts - Cookbook

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

- A cookbook is the fundamental unit of configuration and policy distribution. A cookbook defines a scenario and contains everything that is required to support that scenario:
  - Recipes that specify the resources to use and the order in which they are to be applied
  - Attribute values
  - File distributions
  - Templates
  - Extensions to Chef, such as custom resources and libraries

Chef – Key Concepts - Metadata

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

- The metadata.rb file provides hints to the Chef server to help ensure that cookbooks are deployed to each node correctly.
- Contains information about:
  - Our cookbook
  - Version
  - Maintainer
  - Dependencies
  - Attributes
- It is critical from IMCO to describe the cookbook correctly in our platform.
  - The more information the merrier

Chef – Key Concepts - Attributes

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

- An attribute is a specific detail about a node. Attributes are used by the chef-client to understand:
  - The current state of the node
  - What the state of the node was at the end of the previous chef-client run
  - What the state of the node should be at the end of the current chef-client run
- Attributes are defined by:
  - The state of the node itself
  - Cookbooks (in attribute files and/or recipes)
  - Roles
  - Environments

Chef – Key Concepts - Resources

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

- A resource is a statement of configuration policy that:
  - Describes the desired state for a configuration item
  - Declares the steps needed to bring that item to the desired state
  - Specifies a resource type—such as package, template, or service
  - Lists additional details (also known as resource properties), as necessary
  - Are grouped into recipes, which describe working configurations

Chef – Getting Started

- We need to install the following software in our local environment:
  - ChefDK: Chef client, Berks, Knife, Kitchen, etc.
    - https://docs.chef.io/install_dk.html
  - Vagrant: Tool for managing virtual environments
    - https://www.vagrantup.com/docs/installation/
  - Virtualbox: Our test environment
    - https://www.virtualbox.org/wiki/Downloads

Chef – First Cookbook

DEMO

Inspec

https://www.inspec.io/docs/

- Test framework for compliance and infrastructure testing
- Verify if your infrastructure matches a desired state.
- InSpec is built on top of Rspec uses:
  - Rspec key strengths to easily execute tests and a DSL to write tests
  - InSpec ships with custom audit resources that make it easy to write audit checks and with the ability to run those checks on remote servers.

Inspec– First Cookbook

DEMO

Kitchen

http://kitchen.ci

- Kitchen provides a test harness to execute infrastructure code on one or more platforms in isolation.
- A driver plugin architecture is used to run code on various cloud such as:
  - Amazon EC2,
  - Google GCE
  - Azure
  - Vagrant

Kitchen

http://kitchen.ci/docs/getting-started

KitchenCI

```
---
driver:
name: vagrant

provisioner:
name: chef_zero

platforms:
- name: ubuntu-14.04
- name: windows-2012r2

suites:
- name: client
run_list:
- recipe[postgresql::client]
- name: server
run_list:
- recipe[postgresql::server]
```

Kitchen– First Cookbook

DEMO

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