INTRODUCTION TO CHEF

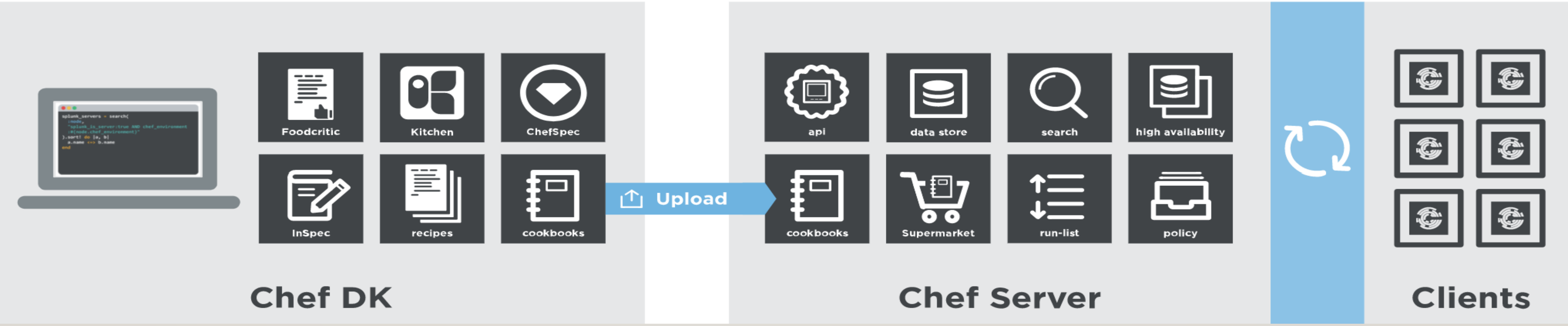
Agenda

- Topics to be covered
  - Introduction to Configuration Management
  - Introduction to Chef
  - Understanding Chef Server and Workstation
  - Working with Run List
  - Bootstrapping Chef nodes
  - Working with Knife
  - Recipes, Cookbooks and resources
  - Writing your first Chef recipe
  - Chef Roles
  - Chef Environments

What is Chef

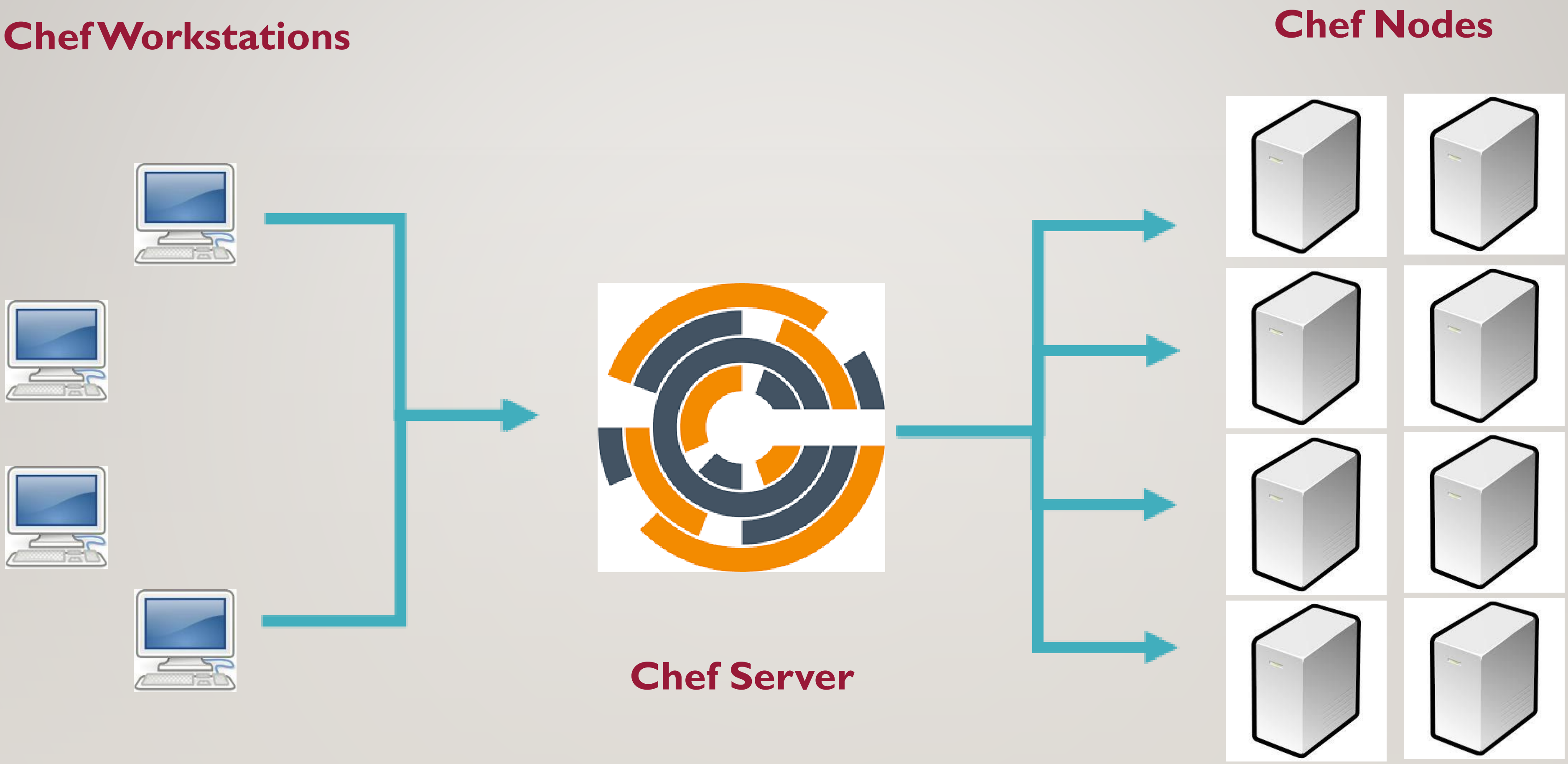
- Chef is a powerful automation platform that transforms infrastructure into code

- Whether you're operating in the cloud, on-premises, or in a hybrid environment, Chef automates how infrastructure is configured, deployed, and managed across your network, no matter its size



This diagram shows how you develop, test, and deploy your Chef code.

CHEF Architecture



Why is Chef required

- Server and Infrastructure component provisioning

- Configuration Management (IaC)

- Application deployment

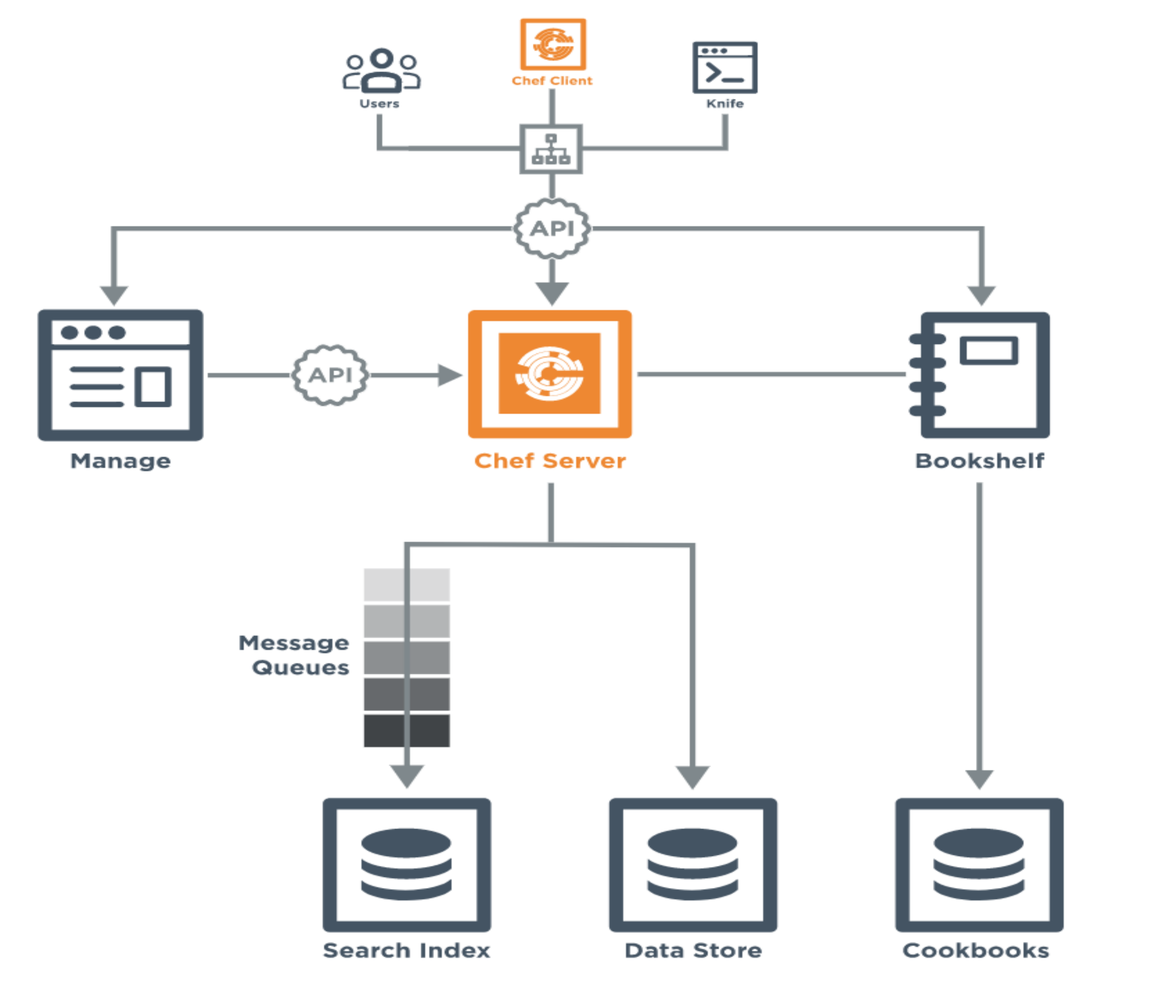
- Creating a organizational Hierarchy (Org, Env, Roles etc.)

What is Chef Server

- Chef Server acts as a hub for storing configuration data

- Responsible for storing:
  - Cookbooks
  - Recipes that are applied to nodes
  - Metadata of nodes which are included in the infrastructure being managed by Chef

CHEF Server Components



Overview of Chef Workstation

- Chef WS is a computer system where all the configurations are developed to be uploaded to Chef Server from where they flow to required nodes

- It runs Chef Development Kit (package that contains everything which are required to implement Chef) to author cookbooks

- Workstation is the system where users carry out most of the configuration related tasks such as:
  - Development of cookbooks and recipes
  - Testing cookbooks, recipes and other chef code
  - Define roles and environments
  - Use data bags for storing critical data
  - Defining all the required policies

What is Chef-DK

- **Chef Development Kit (Chef-DK)**

The Chef Development Kit is a package that contains everything that is needed to start using Chef:

- chef-client and ohai
- chef and knife command line tools
- Testing tools such as Test Kitchen, ChefSpec, Cookstyle, and Foodcritic
- InSpec
- Everything else needed to author cookbooks and upload them to the Chef server

- **Chef-repo**

  Repository structure in which cookbooks are authored, tested and maintained:

  - Cookbooks contain recipes, attributes, custom resources, libraries, files, templates, tests and metadata
  - Chef-repo structure varies across different organizations based on the business requirement
  - Some organizations have all the cookbooks in a single chef-repo whereas some prefer individual chef-repo for every single cookbook

- **Knife**

  Its a command line tool responsible for providing interface between local chef repo and chef server. Helps to manage:

  - Nodes
  - Cookbooks and recipes
  - Roles, Environments, and Data Bags
  - Resources within various cloud environments
  - The installation of the chef-client onto nodes
  - Searching of indexed data on the Chef server

- knife.rb resides in .chef directory and is used for knife setup by specifying configuration details.

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

What is a Chef Node

- A node is any physical, virtual or cloud machine that is configured to be maintained by a chef-client

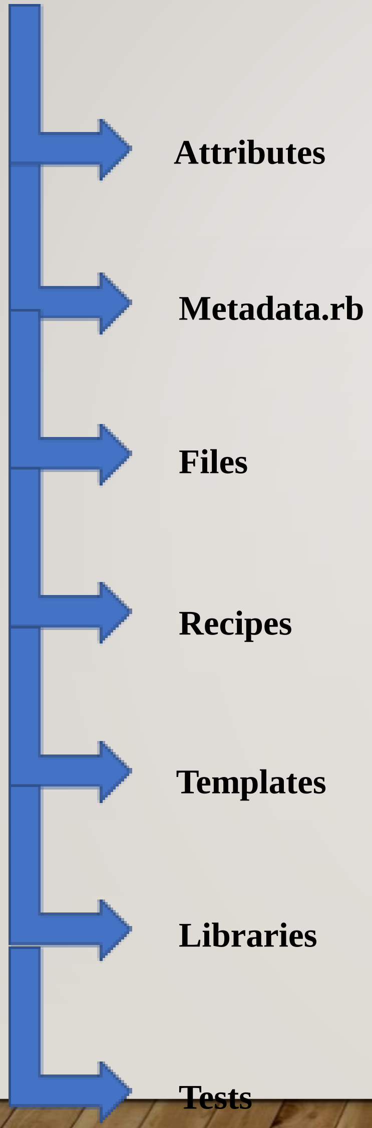
- It can be any system or server that Chef manages using chef-client, some of the examples are listed below:
  - Webserver
  - Application server
  - Load balancer
  - Database

- Here are some of the examples of node types which can be managed by Chef:
    - Server
    - Cloud Instances
    - Virtual Machines
    - Network Devices
    - Containers

What is a Cookbook

- Cookbook is the fundamental unit of configuration and policy distribution
- Defines a scenario and contains everything that is required to support that scenario
- Primarily contains recipes and other related files defined in an organised way so that they can be reused for configuration of applications or other nodes

Cookbook Components



Attributes

Metadata.rb

Files

Recipes

Templates

Libraries

Tests

What are Resources

- These are piece of code which are used to declare a system element and its corresponding action to be performed also termed as statement of Configuration Policy

- Chef provides built-in resources covering all the major useful actions as well as the flexibility to create your own custom resource to handle specific scenarios

- Some Resource Examples are:
    - Package
    - Service
    - File
    - User

What is a Chef Recipe

- Most fundamental configuration element within the organization, residing in a cookbook

- Its a file that contains set of instruction, required to configure a part of the system

- They need to be added to run-list prior to be used by the chef-client, and they always execute in the order they are listed in the run-list

- Recipes may have dependencies on one another

What is a Recipe ?

- Sample recipe to install httpd package, which is to be enabled and started at boot time:

```
package “httpd” do
action :install
end

service “httpd” do
action [ :enable, :start ]
end
```

Overview of Chef Roles

- A role is a way to define certain patterns and processes that exist across nodes in an organization as belonging to a single job function

- Each role consists of zero (or more) attributes and a run-list. Each node can have zero (or more) roles assigned to it

- Some Role Examples:
  - Webserver
  - Appserver
  - Mydb
  - app_LB
  - network_LB

Managing Roles

- There are multiple ways in Chef to manage roles:
    - Knife (on Chef workstation)
    - Chef Management Console (Web UI)
    - Chef server API

THANK YOU