Infrastructure as Code

Application Server Management using Chef

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Craig

Co-Founder
craig@crowdscriber.com
@craiger

Sean

Co-Founder
sean@crowdscriber.com

Why IaC?

- Configuring Application Servers is

  - Redundant

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- Documentation

Why IaC?

- Configuring Application Servers is

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  - Time consuming

  - Error prone

- Application Server Configuration

  - Changes over time

- Documentation

  - Goes stale

Chef

- Platform consisting of

chef-server

Chef

- Platform consisting of

  - Server

chef-server

Chef
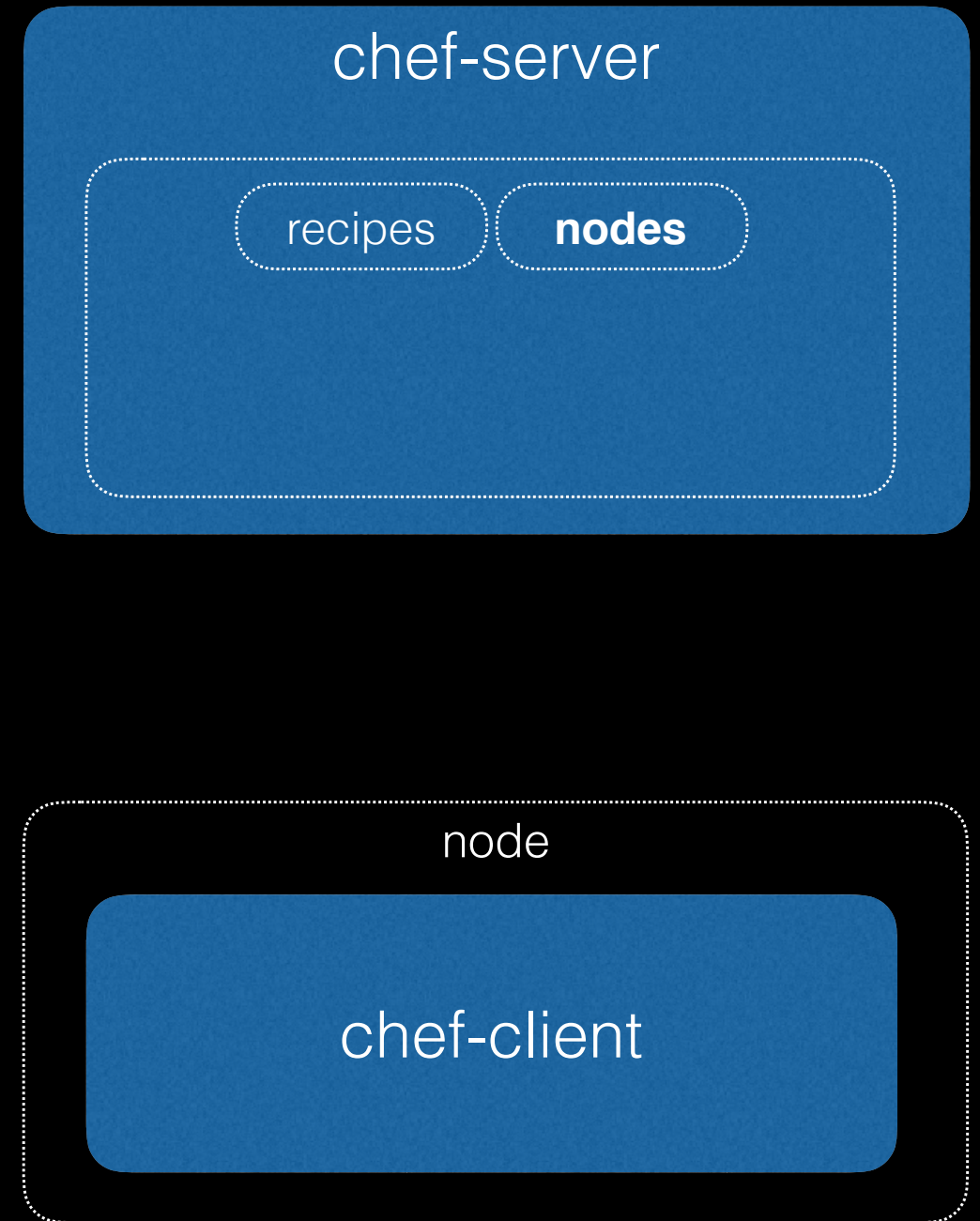
- Platform consisting of
  - Server
  - Client

chef-server

chef-client

Chef

- Platform consisting of
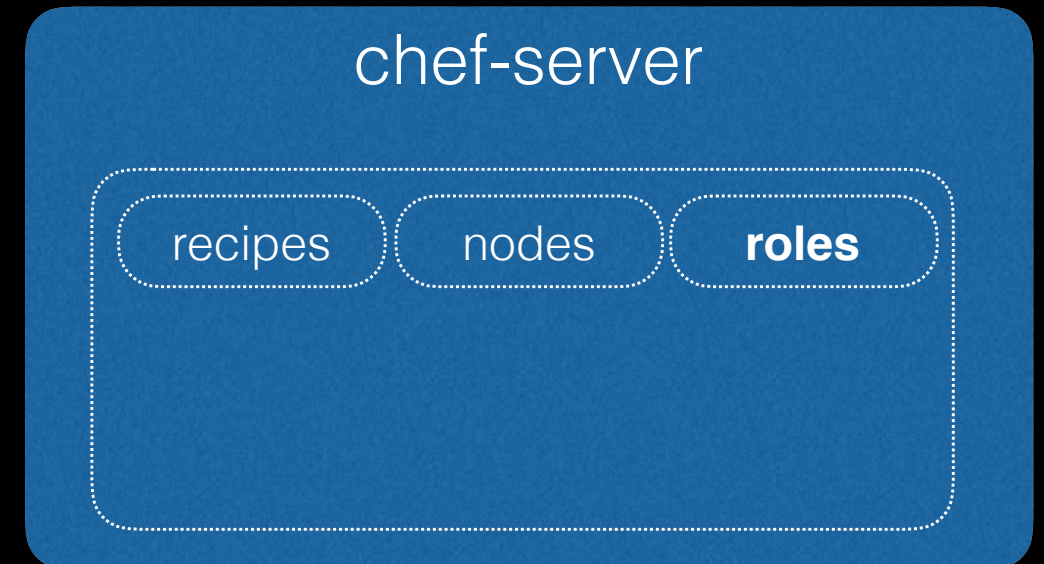
  - Server

  - Client

  - Recipes

chef-server

recipes

chef-client

Chef

- Platform consisting of

  - Server
  - Client
  - Recipes
  - Nodes

chef-server

recipes **nodes**

node

chef-client

Chef

- Platform consisting of

  - Server
  - Client
  - Recipes
  - Nodes
  - Roles

chef-server

recipes   nodes   **roles**

node [**role: web-server**]

chef-client

Chef

- Platform consisting of

  - Server

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  - Recipes

  - Nodes

  - Roles

  - Environments

chef-server

recipes   nodes   roles

environments

node [role: web-server**, env: ereg-dev**]

chef-client

Chef

- Platform consisting of

  - Server

  - Client

  - Recipes

  - Nodes

  - Roles

  - Environments

  - Data Bags

chef-server

recipes   nodes   roles

environments

data-bags

node [role: web-server , env: ereg-dev]

chef-client
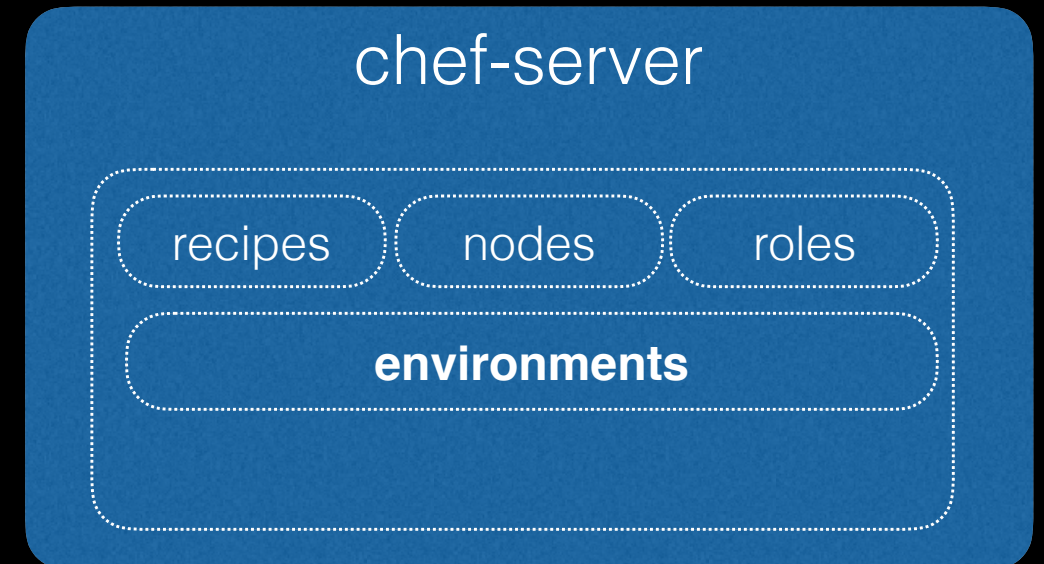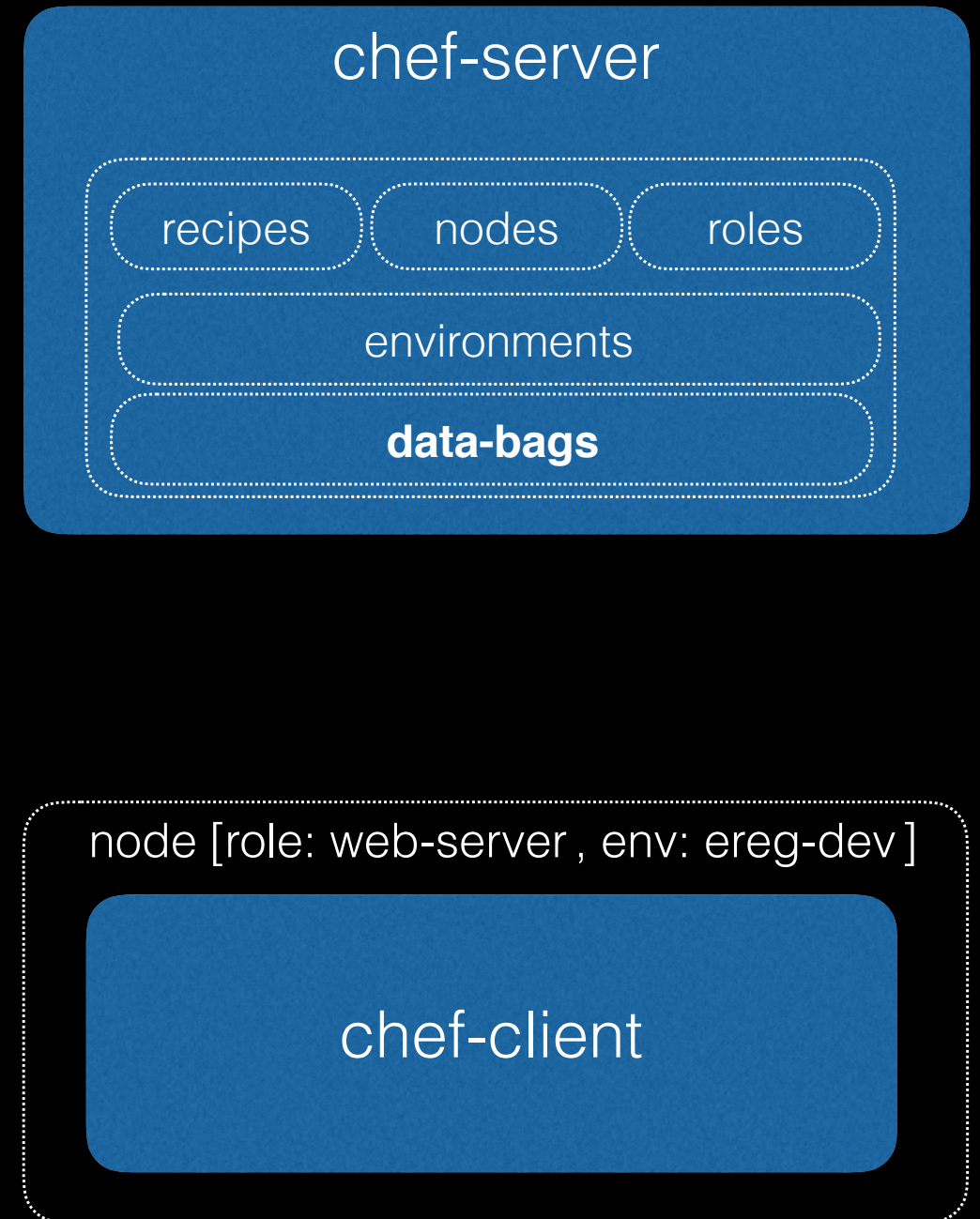
Node Definition

- Identified by FQDN

- node-specific attributes/overrides

- run-list - recipes/roles

- environment

Node

nodes/lukdev01.interal.corp.json
```
{
  "name": "lukedev01.internal.corp",
  "chef_environment": "myapp-dev",
  "normal": {
    "app" : {
      "version": "1.0-SNAPSHOT"
    }
  },
  "run_list": [
   "role[tomcat-server]",
   "role[tomcat-ereg]"
  ]

}
```

chef-server

recipes **nodes** roles

environments

data-bags

Role

- Defines a set of **recipes** to run on a node along with their supporting **attributes**

- e.g. role: tomcat-server

Role

roles/tomcat-server.json

```
{
  "name": "tomcat-server",
  "description": "Apache Tomcat Server",
  "default_attributes": {
    "java_se": {
      "java_home": "C:\jdk\jdk1.8.0",
      "win_jre_home": "C:\jdk\jdk1.8.0\jre",
      "win_addlocal": "ToolsFeature",
      "tomcat_home" : "C:\apache-tomcat..."
    }
  },
  "run_list": [
    "recipe[chocolatey::default]",
    "recipe[tprmb::tomcat]"
  ]
}
```

chef-server

recipes   nodes   **roles**

environments

data-bags

Environment

- Primarily used to provide a set of specialized **attributes** specific to an environment

- Can also be used for pinning **cookbook** versions

Environment

```
environments/myapp-dev.json
{
  "name": "myapp-dev",
  "description": "Our Application in Dev",
  "cookbook_versions": {
  },
  "override_attributes": {
    "app": {
      "env": "dev",
      "version": "1.0-SNAPSHOT",
      "certs": {
        "store_pwd" : "changeit",
        "ssl": {
          "passphrase": "123456789",
          "key_url"   : "http://../lukedv01.key.pem",
          "cert_url"  : "http://../lukedv01.cert.pem"
        },
        "files" : {
          "tpr-ws": {
            "descr": ".NET Webservice certificates",
            "store": "myapp.truststore",
            "url"  : "http://../dotnet-ws.cer"
          },
  .
  .
}
```

chef-server

recipes   nodes   roles

environments

data-bags

Data Bags

- Attributes used across Nodes/Environments/Roles

- Can be encrypted (shared key)

  - **Chef Vault** a better solution

Data Bag

`data_bags/tprmb-servers/artifactory.json`

```json
{
  "id" : "artifactory",
  "url": "http://artifactory.internal.corp/repo",
  "snapshots": "libs-snapshot-local",
  "releases" : "libs-release-local",
  "releases-ext": "libs-release-ext",
  "bin"       : "app-bin-repo"
}
```

chef-server

recipes · nodes · roles

environments

data-bags

Recipes

- Orchestrates **resources**

Recipes

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- Stored in **cookbooks**

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Recipes

- Orchestrates **resources**

- Stored in **cookbooks**

- Idempotent **(should be)**

- References attributes from:

  - roles, environment, cookbooks, data bags

Resources

- Code that manages a *resource*

Resources

- Code that manages a *resource*

- A *resource* is a

  - file

  - package

  - service

  - user

  - etc...

ChefDK

https://downloads.chef.io/chefdk

ChefDK

https://downloads.chef.io/chefdk

- Berkshelf

ChefDK

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- Berkshelf
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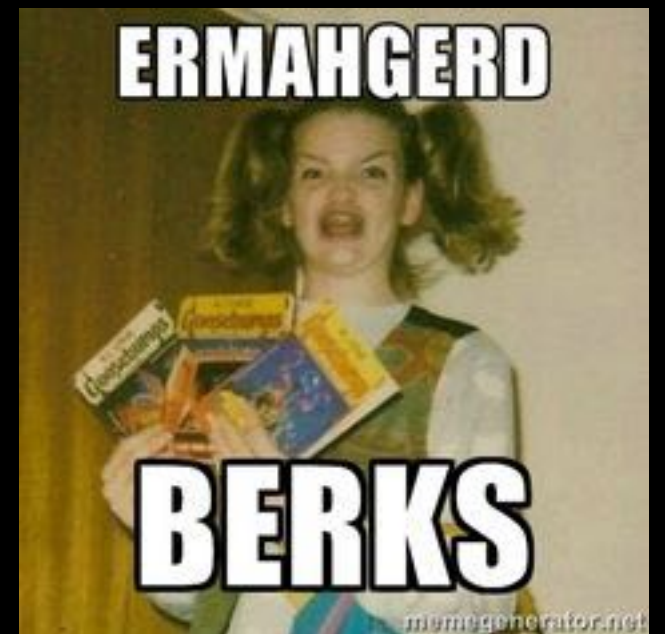
Chef Supermarket

supermarket.chef.io

Chef Supermarket

supermarket.chef.io

Example

Install the **Apache Tomcat** application server on Windows using recipes & resources demonstrating *knife*, *berks* and *chef-client*

Example

recipes, resources, knife

Chef Server

Chef Client

ChefDK

slack.prdcdeliver.com

@craiger

http://github.com/
ctataryn/deliver2017