Chef

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- Infrastructure configuration tool
- Ruby
- Infrastructure as code

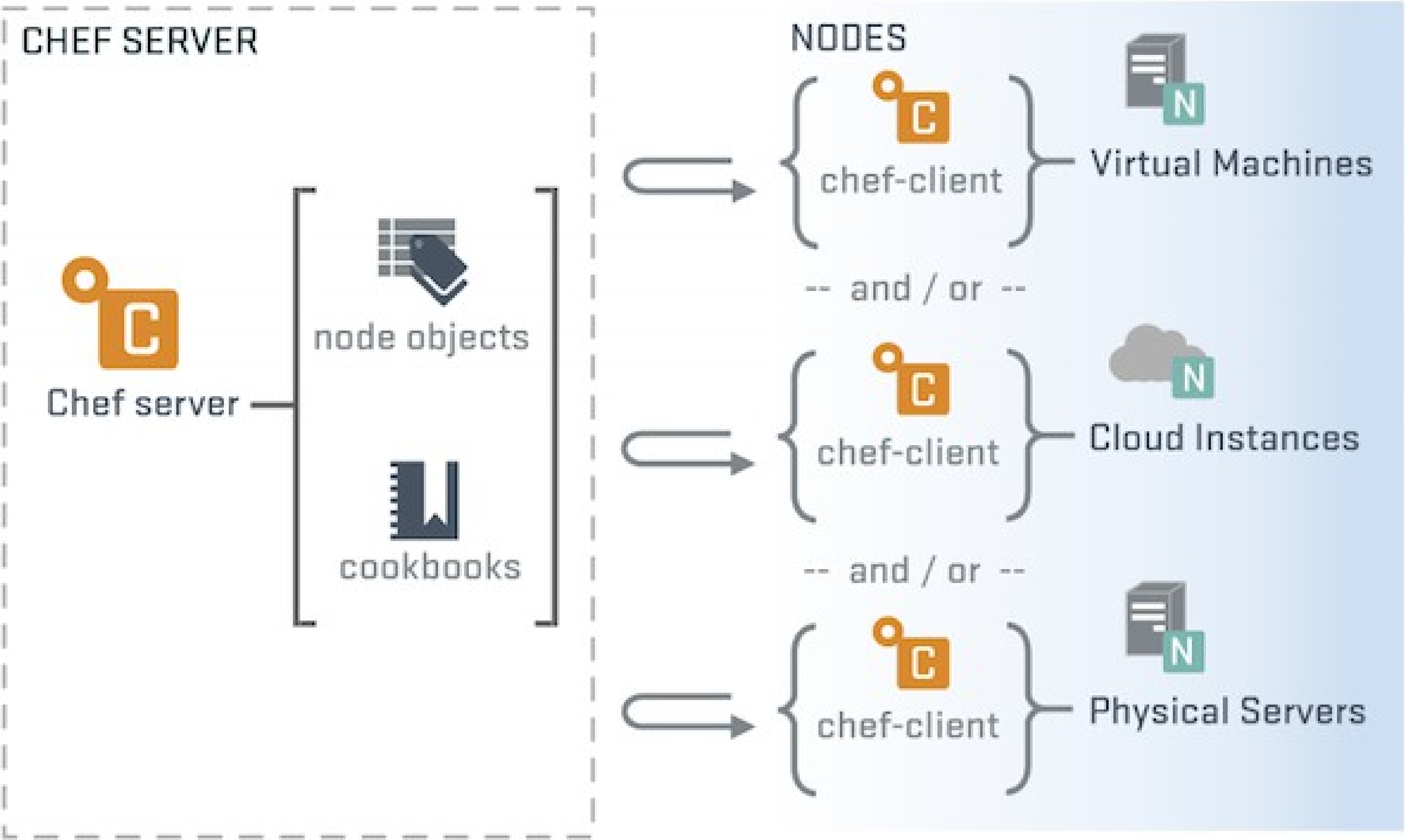
OPSCODE

RULE THE CLOUD

Open Source
Cross Platform

Amazon Web Services
Riot Games
Gamegos :P

- Chef'le yönetilen bir makineye node diyoruz
- Chef node'lar üstünde kaynak yönetimi yapıyor



Chef Server

- Ruby gem
- RSA key authentication / Signed Headers
- RESTful API / cevaplar JSON
- Solr, rabbitmq, postgresql, merb .. ölçeklenebilir
- Cookbook bilgisi
- Node bilgisi

Knife

- Yerel Chef deposuyla (workstation) Chef server arasındaki iletişimi sağlar

```
$ knife node list

$ knife ec2 server create -N "load_balancer1" \
          -E development -r "role[loadbalancer]"



$ knife search node "languages_ruby_version:1.9.3"


$ knife search node 'chef_environment:production \
         AND platform:centos'
```

knife node create, knife bootstrap ..

- Authenticate
- Build Node
- Sync cookbooks
- Converge

```
isbaran@ip-10-11-22-33:~$ cat /etc/chef/client.rb
log_level        :auto
log_location     STDOUT
chef_server_url  "https://chefs.example.com"
validation_client_name "chef-validator"
node_name "load_balancer1"

isbaran@ip-10-11-22-33:~$ cat /etc/chef/client.pem
-----BEGIN RSA PRIVATE KEY-----
```

```
 $ knife node show load_balancer1
Node Name:   load_balancer1
Environment: _default
..
Run List:    role[loadbalancer]
Roles:       loadbalancer, base
Recipes:     chef-client::delete_validation, apt, build-essential,
python, sudo, users::sysadmins, haproxy ..
Platform:    ubuntu 12.04
```

- Recipe'ler içeren cookbook'lar geliştir
- Chef server'a gönder (knife cookbook upload)
- Node'lar için run_list belirle:
  - Doğrudan node'u düzenleyerek (knife node edit)
  - Chef client'a json olarak vererek ..
- Node üstünde chef-client çalıştır (daemon, cron)

```
 $ cat base.rb
name "base"
description "Base Role for all instances"

run_list [
    "recipe[chef-client::delete_validation]",
    "recipe[chef-client::cron]",
    "recipe[apt]",
    "recipe[build-essential]",
    "recipe[python]",
    "recipe[sudo]",
    "recipe[users::sysadmins]"
]
```

```
 $ cat loadbalancer.rb
name "loadbalancer"
description "Load Balancer"

run_list [
    "role[base]",
    "recipe[haproxy]"
]
```

Ohai

- Node özelliklerini (attribute) keşfeder ve chef-client her çalıştığında sunar
- AIX, Darwin, HP-UX, Linux, FreeBSD, OpenBSD, NetBSD, Solaris ….

```
isbaran@ip-10-11-22-33:~$ ohai |grep languages -A 10
  "languages": {
    "ruby": {
      "platform": "x86_64-linux",
      "version": "1.9.3",
      "release_date": "2011-06-30",
      "target": "x86_64-pc-linux-gnu",
      "target_cpu": "x86_64",
      "target_vendor": "pc",
      "target_os": "linux",
      "host": "x86_64-pc-linux-gnu",
      "host_cpu": "x86_64",
isbaran@ip-10-11-22-33:~$ ohai |wc -l
1387
```

```
$ knife search node "languages_ruby_version:1.9.3"
```

```
node['languages']['ruby'][version] == “1.9.3”
```

Attributes

- Json
- Çalışma esnasında automatic (ohai) kalıcı attribute'lar ile birleştirilirler
- Öntanımlı değerleri olabilir, override edilebilirler

```
{ “haproxy”: { “port”: “8000” } }
node[:haproxy][:port] => 8000
```

Cookbooks

```
 $ cat cookbooks/cron/metadata.rb
name             "cron"
maintainer       "Opscode, Inc."
maintainer_email "cookbooks@opscode.com"
license          "Apache 2.0"
description      "Installs cron"
long_description IO.read(File.join(File.dirname(__FILE__), 'README.md'))
version          "1.2.8"

%w{redhat centos scientific fedora amazon debian ubuntu raspbian}.each do |os|
  supports os
end

depends xxx

recipe            'cron', 'Installs cron package and enables service'
```

```
$ knife cookbook site search cron
apt-periodic:
  cookbook:             http://cookbooks.opscode.com/api/v1/cookbooks/apt-periodic
  cookbook_description: Installs/configures apt-periodic and unattended-upgrades
  cookbook_maintainer:  madwork
  cookbook_name:        apt-periodic
chef-client-cron:
  cookbook:             http://cookbooks.opscode.com/api/v1/cookbooks/chef-client-cron
  cookbook_description: Manages aspects of only chef-client
  cookbook_maintainer:  bryanwb
  cookbook_name:        chef-client-cron
cron:
  cookbook:             http://cookbooks.opscode.com/api/v1/cookbooks/cron
  cookbook_description: Installs cron
  cookbook_maintainer:  opscode
  cookbook_name:        cron
crontab:
  cookbook:             http://cookbooks.opscode.com/api/v1/cookbooks/crontab
  cookbook_description: Configures crontab
  cookbook_maintainer:  enis
  cookbook_name:        crontab
...
```

```
$ knife cookbook site share cron
```

Recipes

- Sistemde ayarlanması istenen kısmın gelmesi gereken son hali resource'lar ve gerekliyse ruby kodu kullanarak yazıldığı yerler
- Belirtilen sırayla resource'lar uygulanır
- Idempotent

```
package "postfix"

if node['postfix']['use_procmail']
  package "procmail"
end

service "postfix" do
  supports :status => true, :restart => true, :reload => true
  action :enable
end

case node['platform_family']
when "rhel", "fedora"

  service "sendmail" do
    action :nothing
  end

  execute "switch_mailer_to_postfix" do
    command "/usr/sbin/alternatives --set mta /usr/sbin/sendmail.postfix"
    notifies :stop, "service[sendmail]"
    notifies :start, "service[postfix]"
    not_if "/usr/bin/test /etc/alternatives/mta -ef
/usr/sbin/sendmail.postfix"
  end
end
...
```

Resources

- Tüm platformlar için tek syntax

  Cron
  Directory
  Execute
  Mount
  Template
  Script
  File
  Package
  ..

- Provider'lar vasıtasıyla iş yaparlar
- Diğer resource'larla haberleşirler

Providers

```
gem_package "minitest"

package "minitest" do
  provider Chef::Provider::Package::Rubygems
End


:redhat => {
  :default => {
    :service => Chef::Provider::Service::Redhat,
    :cron => Chef::Provider::Cron,
    :package => Chef::Provider::Package::Yum,
    :mdadm => Chef::Provider::Mdadm
  }
}
```

cookbooks/sudo/attributes/default.rb

```
default['authorization']['sudo']['prefix']            = '/etc'
default['authorization']['sudo']['passwordless']      = false
```

cookbooks/sudo/recipes/default.rb

```
prefix = node['authorization']['sudo']['prefix']
```

Default attribute

```
template "#{prefix}/sudoers" do
  source 'sudoers.erb'
  mode   '0440'
  owner  'root'
  group  node['root_group']
  variables(
    :sudoers_groups    => node['authorization']['sudo']['groups'],
    :passwordless      => node['authorization']['sudo']['passwordless']
  )
end
```

Ohai attribute

cookbooks/sudo/templates/{default,mac_os_x,ubuntu..}/sudoers.erb

```
<% @sudoers_groups.each do |group| -%>
# Members of the group '<%= group %>' may gain root privileges
%<%= group %> ALL=(ALL) <%= "NOPASSWD:" if @passwordless %>ALL
<% end -%>
```

..

Data Bags

- Global
- Base64 encode + AES-256-CBC encrypted

```
admins = data_bag('admins')

admins.each do |login|
  admin = data_bag_item('admins', login)
  home = "/home/#{login}"

  user(login) do
    uid       admin['uid']
    gid       admin['gid']
    shell     admin['shell']
    comment   admin['comment']
    home      home
    supports  :manage_home => true
  end
end
```

chef-shell

- Recipe debug etmek için
- irb oturumu

```
breakpoint "name" do
 action :break
end
```

chefspec

```
require 'chefspec'

describe 'ntp_client' do
  let(:chef_run) { ChefSpec::Runner.new.converge(described_recipe) }
  let(:template) { chef_run.template('/etc/ntp.conf') }

  before do
    stub_data_bag_item("ntp", "default_server").and_return({})
  end

  it "expects ntp package to be installed" do
    expect(chef_run).to install_package("ntp")
  end

  it "creates ntp.conf config file" do
    expect(chef_run).to create_template('/etc/ntp.conf')
    expect(template).to notify('service[ntp]').to(:restart)
  end
end
```

chef-solo = chef-client -

- Node data store
- Search
- Authentication or authorization
- Persistent attributes

Environments

- _default
- production, staging, testing, development
- app1, app2, app3

```
{
  "name": "production",
  "description": "Production Environment",
  "cookbook_versions": {
    "apache2" : "= 1.8.14",
    "apt" : "= 2.3.4",
    "bluepill" : "= 2.3.0",
    "blockdevice" : "= 0.1.5",
    "build-essential" : "= 1.4.2",
...
```

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