

# Apache Ambari Tutorial

Chonnam National University

Muhammad Fiqri Muthohar

# Prerequisites

- ▶ VirtualBox (<https://www.virtualbox.org/wiki/Downloads>)
- ▶ Vagrant (<http://vagrantup.com/>)

# System Requirements

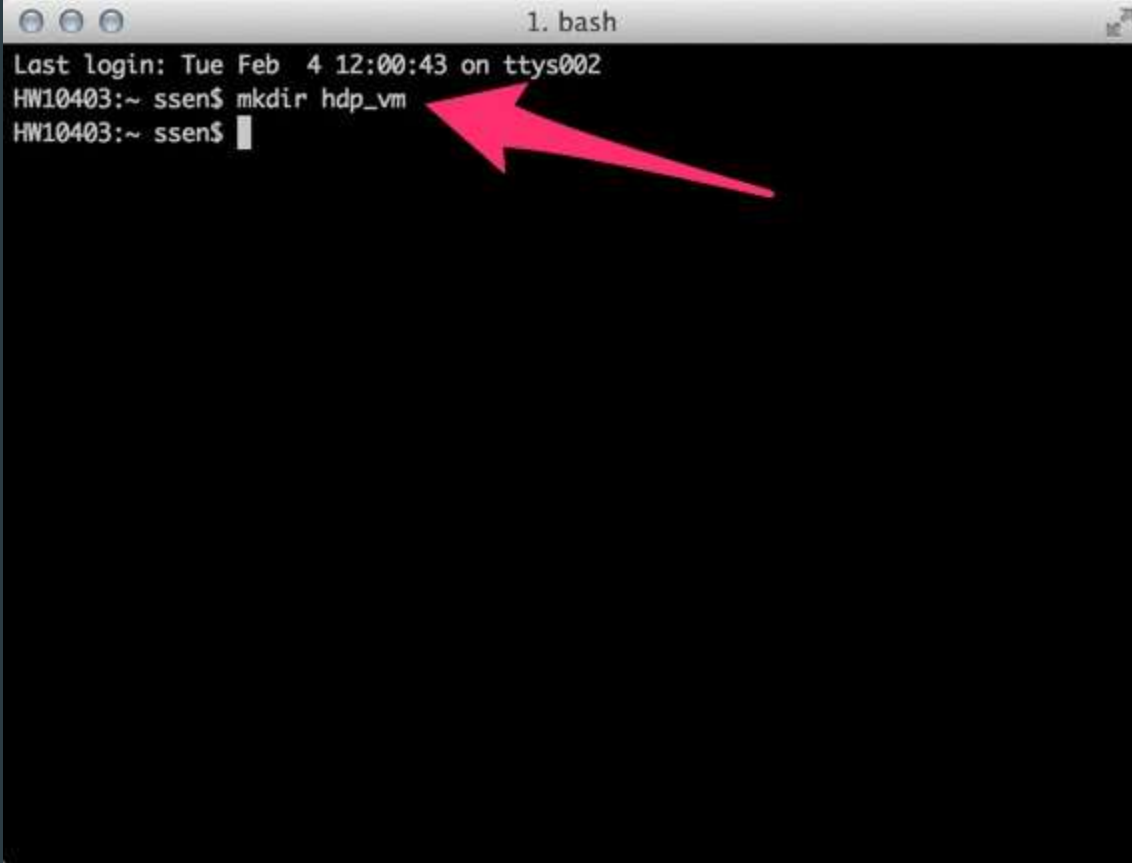
- ▶ Minimum 4GB RAM for the VM
- ▶ Virtualization enabled on BIOS

## Prepare VM using Vagrant

# Folder Creation

- ▶ Create a folder for this VM

```
1. bash
Last login: Tue Feb  4 12:00:43 on ttys002
HW10403:~ ssen$ mkdir hdp_vm
HW10403:~ ssen$
```

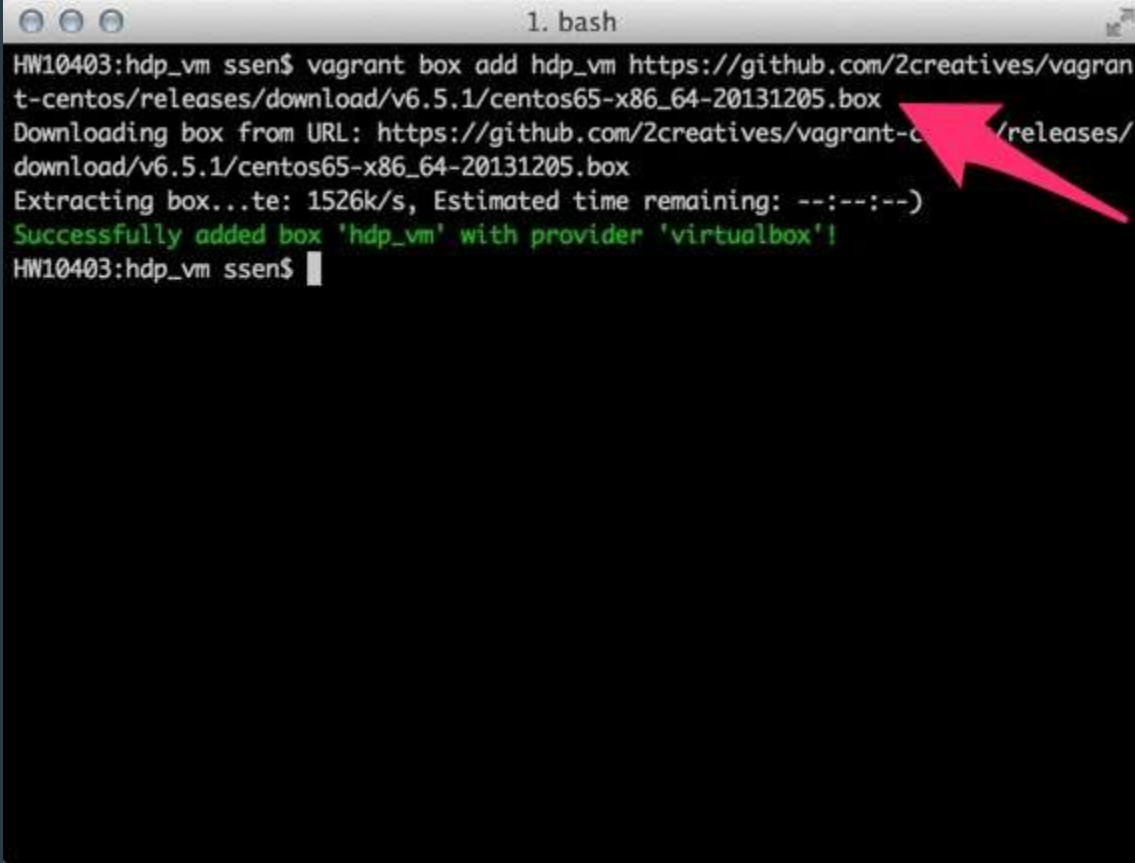
A terminal window titled "1. bash" showing the execution of the 'mkdir hdp\_vm' command. The output shows the command was successful. A red arrow points to the command line.

Prepare VM using Vagrant

## Adding Vagrant Box

- ▶ If you have Virtual Box and Vagrant installed on your system, change directory to it and issue the following command:

```
vagrant box add hdp_vm  
https://github.com/2creatives/vagrant-  
centos/releases/download/v6.5.1/centos65-  
x86_64-20131205.box
```



```
1. bash  
HW10403:hdp_vm ssen$ vagrant box add hdp_vm https://github.com/2creatives/vagran  
t-centos/releases/download/v6.5.1/centos65-x86_64-20131205.box  
Downloading box from URL: https://github.com/2creatives/vagrant-c /releases/  
download/v6.5.1/centos65-x86_64-20131205.box  
Extracting box...te: 1526k/s, Estimated time remaining: --:--:--)  
Successfully added box 'hdp_vm' with provider 'virtualbox'  
HW10403:hdp_vm ssen$
```

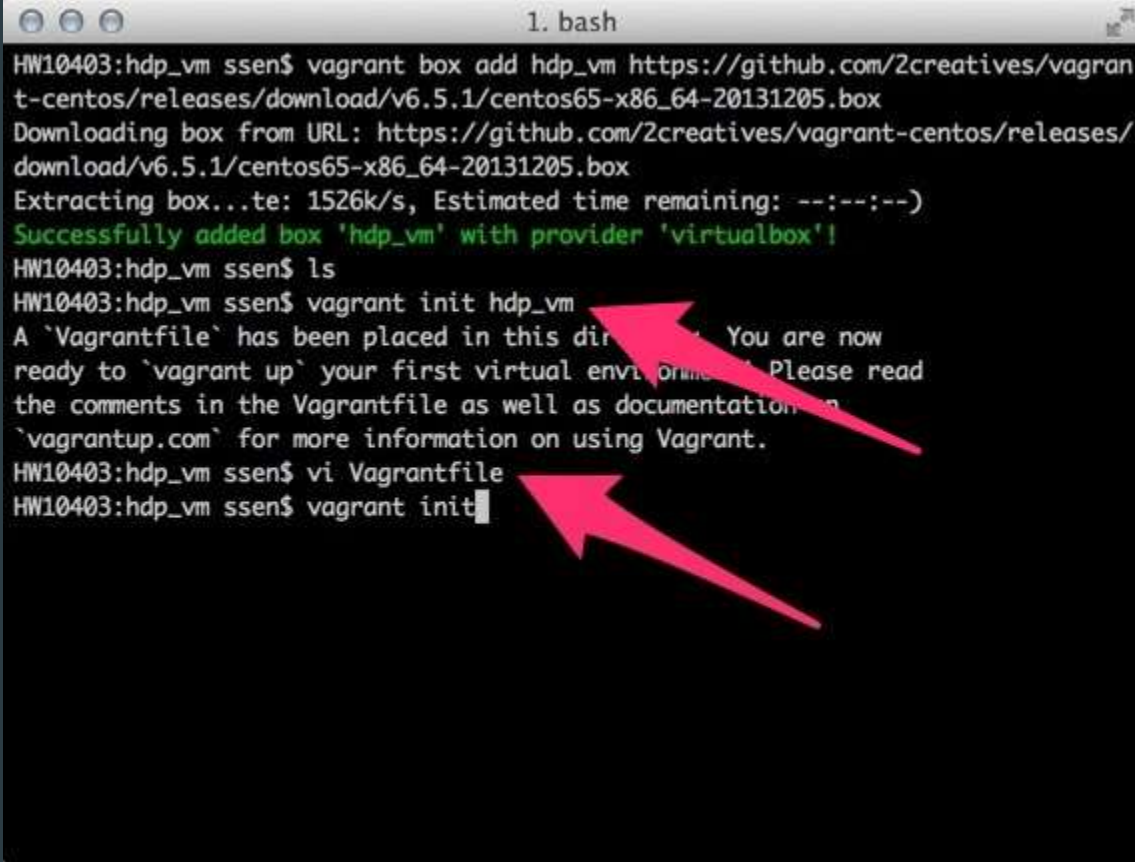
Prepare VM using Vagrant

# Init the VM configuration

- ▶ Once it has completed the download and added to your library of VMs with the name `hdp_vm`, issue the command:

```
vagrant init hdp_vm
```

- ▶ This will create a file “Vagrantfile” in the folder. Open it in a text editor.



```
1. bash
HW10403:hdp_vm ssen$ vagrant box add hdp_vm https://github.com/2creatives/vagrant-centos/releases/download/v6.5.1/centos65-x86_64-20131205.box
Downloading box from URL: https://github.com/2creatives/vagrant-centos/releases/download/v6.5.1/centos65-x86_64-20131205.box
Extracting box...te: 1526k/s, Estimated time remaining: --:--:--
Successfully added box 'hdp_vm' with provider 'virtualbox'!
HW10403:hdp_vm ssen$ ls
HW10403:hdp_vm ssen$ vagrant init hdp_vm
A `Vagrantfile` has been placed in this directory. You are now
ready to `vagrant up` your first virtual environment. Please read
the comments in the Vagrantfile as well as documentation on
`vagrantup.com` for more information on using Vagrant.
HW10403:hdp_vm ssen$ vi Vagrantfile
HW10403:hdp_vm ssen$ vagrant init
```

Prepare VM using Vagrant

# Change Forwarded Port

- ▶ Edit the 'Vagrantfile', so that port 8080 on the VM is forwarded to port 8080 on the host.
- ▶ If that port already use, change it to another port number.

```
1. vim
# All Vagrant configuration is done here. The most common configuration
# options are documented and commented below. For a complete reference,
# please see the online documentation at vagrantup.com.

# Every Vagrant virtual environment requires a box to build off of.
config.vm.box = "hdp_vm"

# The url from where the 'config.vm.box' box will be fetched if it
# doesn't already exist on the user's system.
# config.vm.box_url = "http://domain.com/path/to/above.box"

# Create a forwarded port mapping which allows access to a specific port
# within the machine from a port on the host machine. In the example below,
# accessing "localhost:8080" will access port 80 on the guest machine.
config.vm.network :forwarded_port, guest: 8080, host: 8080

# Create a private network, which allows host-only access to the machine
# using a specific IP.
# config.vm.network :private_network, ip: "192.168.33.10"

# Create a public network, which generally matched to bridged network.
# Bridged networks make the machine appear as another physical device on
# your network.
-- INSERT --
```

Prepare VM using Vagrant

# Change VM Memory Allocation

- ▶ Modify the settings so that the VM is assigned adequate memory once it launched.
- ▶ At least 4GB of RAM needed for this VM to run well.

```
1. vim
# Default value: false
# config.ssh.forward_agent = true

# Share an additional folder to the guest VM. The first argument is
# the path on the host to the actual folder. The second argument is
# the path on the guest to mount the folder. And the optional third
# argument is a set of non-required options.
# config.vm.synced_folder "../data", "/vagrant_data"

# Provider-specific configuration so you can fine-tune various
# backing providers for Vagrant. These expose provider-specific options.
# Example for VirtualBox:
#
config.vm.provider :virtualbox do |vb|
# # Don't boot with headless mode
# vb.gui = true
#
# # Use VBoxManage to customize the VM. For example to change memory:
vb.customize ["modifyvm", :id, "--memory", "8192"]
end
#
# View the documentation for the provider you're using for more
# information on available options.
-- INSERT --
```



Prepare VM using Vagrant

# Start up The VM

- ▶ Now you can start your VM using this command:  
`vagrant up`
- ▶ Once the VM launched, SSH in and login as root and change the home directory of the 'root'.

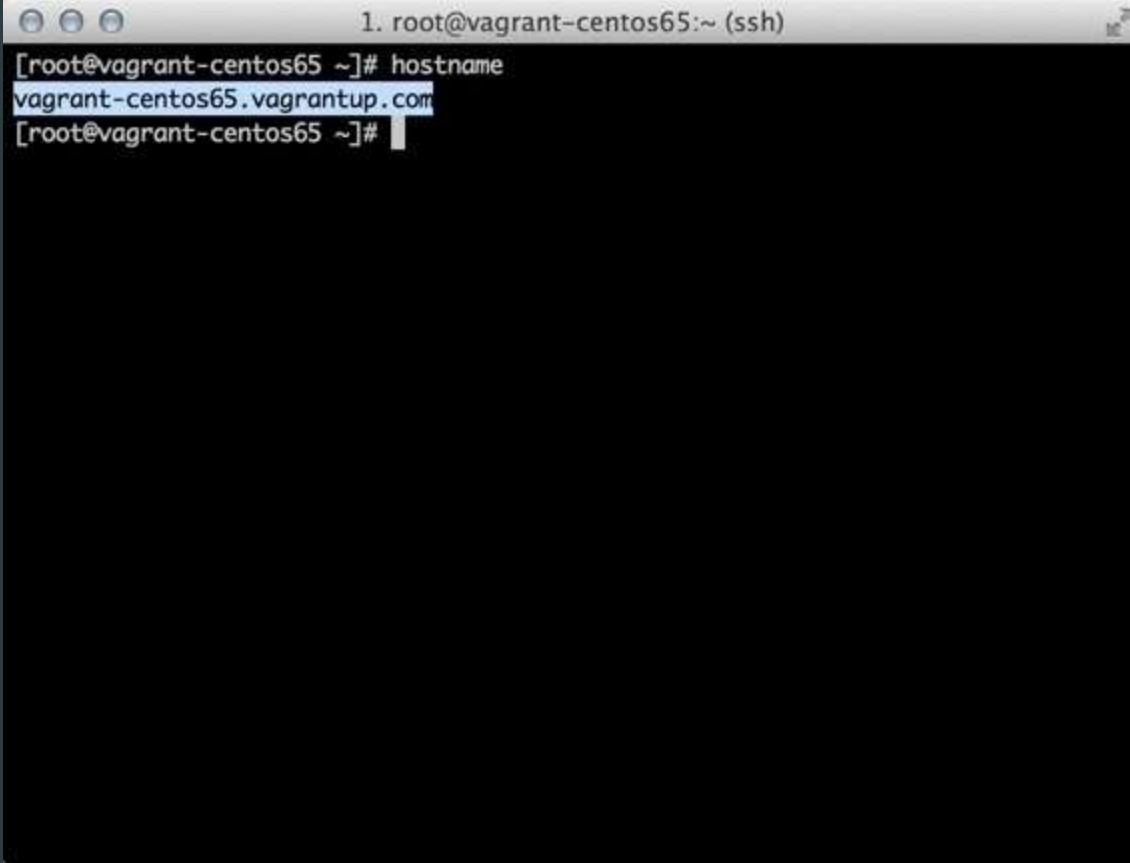
```
1. root@vagrant-centos65:~ (ssh)
HW10403:hdp_vm ssen$ vagrant init
'Vagrantfile' already exists in this directory. Remove it before
running 'vagrant init'.
HW10403:hdp_vm ssen$ vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
[default] Importing base box 'hdp_vm...'
[default] Matching MAC address for NAT networking...
[default] Setting the name of the VM...
[default] Clearing any previously set forwarded ports...
[default] Clearing any previously set network interfaces...
[default] Preparing network interfaces based on configuration...
[default] Forwarding ports...
[default] -- 22 => 2222 (adapter 1)
[default] -- 8080 => 8080 (adapter 1)
[default] Running 'pre-boot' VM customizations...
[default] Booting VM...
[default] Waiting for machine to boot. This may take a few minutes...
[default] Machine booted and ready!
[default] Mounting shared folders...
[default] -- /vagrant
HW10403:hdp_vm ssen$ vagrant ssh
[vagrant@vagrant-centos65 ~]$ sudo su
[root@vagrant-centos65 vagrant]# cd ~
[root@vagrant-centos65 ~]#
```

Configure the VM

## Find out VM Hostname

- ▶ Find out the default hostname of the VM and note it down. You can type this command:

```
hostname
```

A terminal window titled "1. root@vagrant-centos65:~ (ssh)" showing the execution of the 'hostname' command. The output is 'vagrant-centos65.vagrantup.com'.

```
1. root@vagrant-centos65:~ (ssh)
[root@vagrant-centos65 ~]# hostname
vagrant-centos65.vagrantup.com
[root@vagrant-centos65 ~]#
```



Configure the VM

# Install NTP service

- ▶ Install NTP service using this following command:

```
yum install ntp
```

- ▶ Once installed, turn on the NTP service with these command:

```
chkconfig ntpd on  
Service ntpd start
```

- ▶ Next we will install the wget utility with this following command:

```
yum install wget
```

```
1. root@vagrant-centos65:~/home/vagrant (bash)
(1/2): ntp-4.2.6p5-1.el6.centos.x86_64.rpm | 592 kB | 00:00
(2/2): ntpdate-4.2.6p5-1.el6.centos.x86_64.rpm | 75 kB | 00:00
-----
Total | 126 kB/s | 667 kB | 00:05
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing : ntpdate-4.2.6p5-1.el6.centos.x86_64 | 1/2
  Installing : ntp-4.2.6p5-1.el6.centos.x86_64 | 2/2
  Verifying : ntp-4.2.6p5-1.el6.centos.x86_64 | 1/2
  Verifying : ntpdate-4.2.6p5-1.el6.centos.x86_64 | 2/2

Installed:
ntp.x86_64 0:4.2.6p5-1.el6.centos

Dependency Installed:
ntpdate.x86_64 0:4.2.6p5-1.el6.centos

Complete!
[root@vagrant-centos65 vagrant]# vi /etc/hosts
[root@vagrant-centos65 vagrant]# chkconfig ntpd on
[root@vagrant-centos65 vagrant]# service ntpd start
Starting ntpd: [ OK ]
```

## Configure the VM

# Setting up password-less SSH

- ▶ Get a pair of keys using this command:

```
ssh-keygen
```

- ▶ The keys will be placed in the folder `.ssh`.
  - ▶ Copy the `id_rsa` file to `/vagrant` folder so that you can access the private key from the host machine as `/vagrant` is automatically the shared folder between host and guest OSs.
  - ▶ Also append `id_rsa.pub`, the public key to the `authorized_keys` keys file.

```
1. root@vagrant-centos65:~ (bash)
[root@vagrant-centos65 ~]# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Created directory '/root/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
7d:28:ba:9b:48:f1:d3:9b:f5:38:46:ec:40:e3:c4:30 root@vagrant-centos65.vagrantup.com
The key's randomart image is:
+--[ RSA 2048 ]-----+
|
|   E
|   +
|   =. .
|   +Soo .
|   o oo.o.
|   . + .+.
|   . . + ++o
|   . +.o....
+-----+
[root@vagrant-centos65 ~]#
```

```
1. root@vagrant-centos65:~/ .ssh (bash)
Created directory '/root/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
7d:28:ba:9b:48:f1:d3:9b:f5:38:46:ec:40:e3:c4:30 root@vagrant-centos65.vagrantup.com
The key's randomart image is:
+--[ RSA 2048 ]-----+
|
|   E
|   +
|   =. .
|   +Soo .
|   o oo.o.
|   . + .+.
|   . . + ++o
|   . +.o....
+-----+
[root@vagrant-centos65 ~]# cd .ssh
[root@vagrant-centos65 .ssh]# cp id_rsa /vagrant/
[root@vagrant-centos65 .ssh]# cat id_rsa.pub >> authorized_keys
[root@vagrant-centos65 .ssh]#
```

## Setup Ambari

# Add Ambari Repository list

- ▶ Download and copy the Ambari repository bits to '/etc/yum.repos.d' :

```
wget http://public-repo-1.hortonworks.com/ambari/centos6/1.x/updates/1.4.3.38/ambari.repo
```

```
cp ambari.repo /etc/yum.repos.d
```

- ▶ Double check that repo has been configured correctly by run this command:

```
yum repolist
```

```
1. root@vagrant-centos65:~/ssh (bash)
[root@vagrant-centos65 .ssh]# cat id_rsa.pub >> authorized_keys
[root@vagrant-centos65 .ssh]# wget http://public-repo-1.hortonworks.com/ambari/centos6/1.x/updates/1.4.3.38/ambari.repo
--2014-02-06 18:07:29-- http://public-repo-1.hortonworks.com/ambari/centos6/1.x/updates/1.4.3.38/ambari.repo
Resolving public-repo-1.hortonworks.com... 205.251.215.199, 54.230.140.152, 54.230.140.231, ...
Connecting to public-repo-1.hortonworks.com|205.251.215.199|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 770 [binary/octet-stream]
Saving to: "ambari.repo"

100%[=====>] 770      --.-K/s  in 0.002s

2014-02-06 18:07:34 (364 KB/s) - "ambari.repo" saved [770/770]

[root@vagrant-centos65 .ssh]# mv ambari.repo /etc/yum.repos.d
[root@vagrant-centos65 .ssh]# yum repolist
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
* base: centos-mirror.jchost.net
* epel: mirrors.solfo.com
* extras: centos.sonn.com
* updates: centos-distro.cavecreek.net
```

## Setup Ambari

# Installing Ambari

- ▶ Now, we can install Ambari Server using this command:

```
yum install ambari-server
```

```
1. root@vagrant-centos65:~ (bash)
* updates: centos-distro.cavecreek.net
HDP-UTILS-1.1.0.16                | 2.9 kB    00:00
HDP-UTILS-1.1.0.16/primary_db    | 35 kB    00:00
Updates-ambari-1.4.3.38         | 2.9 kB    00:00
Updates-ambari-1.4.3.38/primary_db | 4.6 kB    00:00
ambari-1.x                       | 1.3 kB    00:00
ambari-1.x/primary               | 1.9 kB    00:00
ambari-1.x                       |           5/5
repo id                           repo name                               status
HDP-UTILS-1.1.0.16                Hortonworks Data Platform Utils Version - HDP-UT 61
Updates-ambari-1.4.3.38         ambari-1.4.3.38 - Updates                5
ambari-1.x                       Ambari 1.x                               5
base                              CentOS-6 - Base                           6,359+8
epel                              Extra Packages for Enterprise Linux 6 - x86_64 10,440
extras                            CentOS-6 - Extras                         14
updates                            CentOS-6 - Updates                        447+16
repolist: 17,331
[root@vagrant-centos65 .ssh]#
[root@vagrant-centos65 .ssh]#
[root@vagrant-centos65 .ssh]# cd ~
[root@vagrant-centos65 ~]# yum install ambari-server
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
```

## Setup Ambari

# Configuring Ambari

- ▶ After the installation finish, we can configure Ambari using this command:  
`ambari-server setup`
- ▶ You can proceed with the default configuration during the process.

```
1. root@vagrant-centos65:~ (bash)
Installing : postgresql-libs-8.4.18-1.el6_4.x86_64 1/4
Installing : postgresql-8.4.18-1.el6_4.x86_64 2/4
Installing : postgresql-server-8.4.18-1.el6_4.x86_64 3/4
Installing : ambari-server-1.4.3.38-1.noarch 4/4
Verifying : ambari-server-1.4.3.38-1.noarch 1/4
Verifying : postgresql-libs-8.4.18-1.el6_4.x86_64 2/4
Verifying : postgresql-8.4.18-1.el6_4.x86_64 3/4
Verifying : postgresql-server-8.4.18-1.el6_4.x86_64 4/4

Installed:
ambari-server.noarch 0:1.4.3.38-1

Dependency Installed:
postgresql.x86_64 0:8.4.18-1.el6_4
postgresql-libs.x86_64 0:8.4.18-1.el6_4
postgresql-server.x86_64 0:8.4.18-1.el6_4

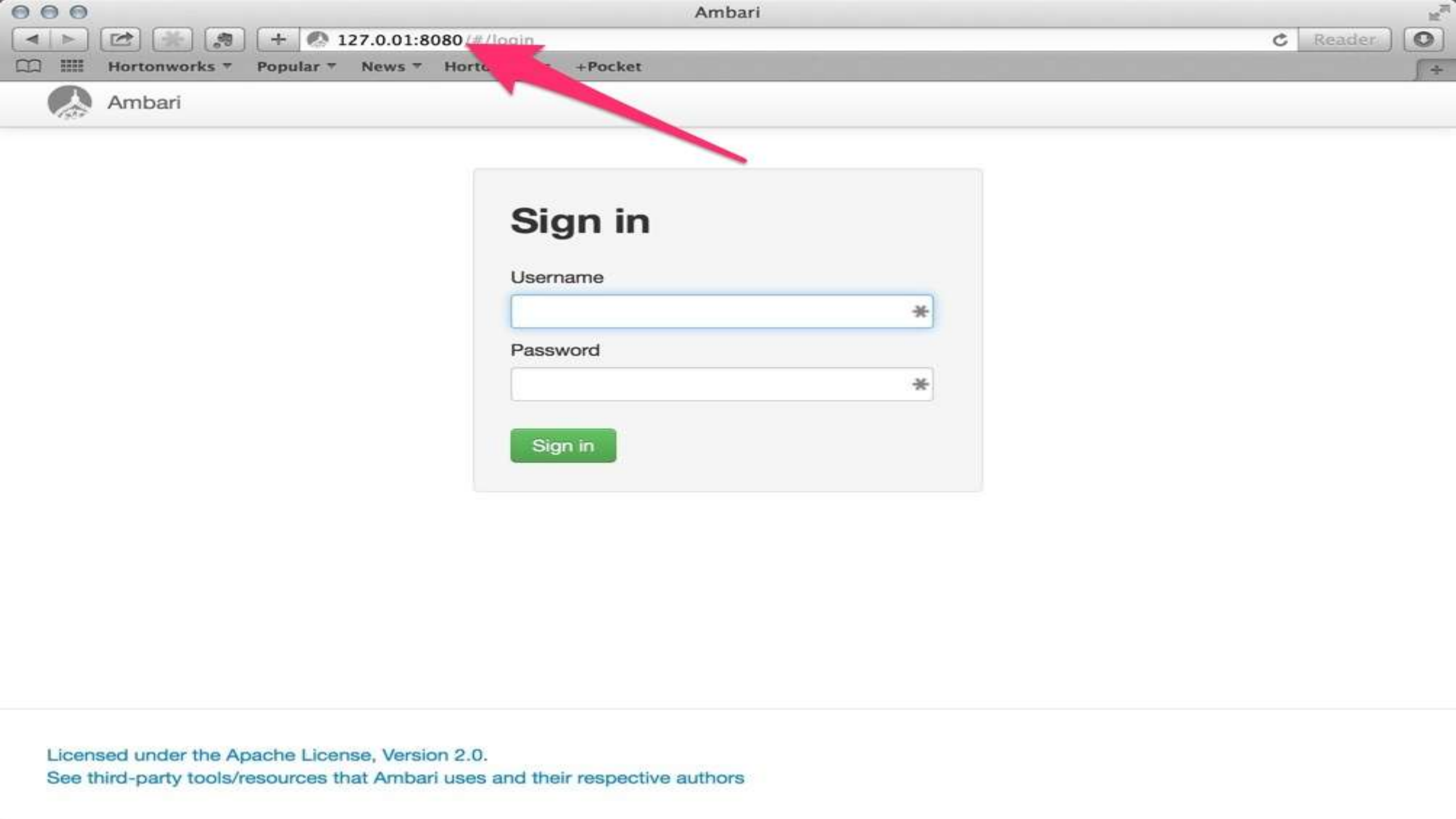
Complete!
[root@vagrant-centos65 ~]# ambari-server setup
Using python /usr/bin/python2.6
Setup ambari-server
Checking SELinux...
SELinux status is 'disabled'
Customize user account for ambari-server daemon [y/n] (n)?
```



Setup Ambari

# Pseudo-cluster with Ambari

- ▶ After finishing the configuration, you can access Ambari from your host machine using your web browser.
- ▶ Access URL is <http://localhost:8080>, or change 8080 with your defined port in the configuration phase before.
- ▶ Default username and password is 'admin' and 'admin'.



127.0.0.1:8080/#/login

## Sign in

Username

 \*

Password

 \*

Sign in

Setup Ambari

## Pseudo-cluster with Ambari (cont.)

- ▶ After login, if this your first time login to the Ambari, it will serve you wizard setup to create your cluster.
- ▶ Name your cluster.
- ▶ Select Hadoop version.
- ▶ Input the hostname of your VM and click on the Choose File button to upload your SSH private key before.
- ▶ Select services that you want to install.

## CLUSTER INSTALL WIZARD

### Welcome

Select Stack

Install Options

Confirm Hosts

Choose Services

Assign Masters

Assign Slaves and Clients

Customize Services

Review

Install, Start and Test

Summary

# Welcome to Apache Ambari!

Ambari makes it easy to install, manage, and monitor Hadoop clusters. We will walk you through the cluster installation process with this step-by-step wizard.

Name your cluster [Learn more](#)

Next →

## CLUSTER INSTALL WIZARD

Welcome

Select Stack

Install Options

Confirm Hosts

Choose Services

Assign Masters

Assign Slaves and Clients

Customize Services

Review

Install, Start and Test

Summary

# Select Stack

Please select the service stack that you want to use to install your Hadoop cluster.

## Stacks

- HDP 2.0.6
- HDP 1.3.3
- HDP 1.3.2

▶ [Advanced Repository Options](#)

← Back

Next →

## WIZARD

[Welcome](#)[Select Stack](#)**Install Options**[Confirm Hosts](#)[Choose Services](#)[Assign Masters](#)[Assign Slaves and Clients](#)[Customize Services](#)[Review](#)[Install, Start and Test](#)[Summary](#)

# Install Options

Enter the list of hosts to be included in the cluster and provide your SSH key.

## Target Hosts

Enter a list of hosts using the Fully Qualified Domain Name (FQDN), one per line. Or use [Pattern Expressions](#)

vagrant-centos65.vagrantup.com

## Host Registration Information

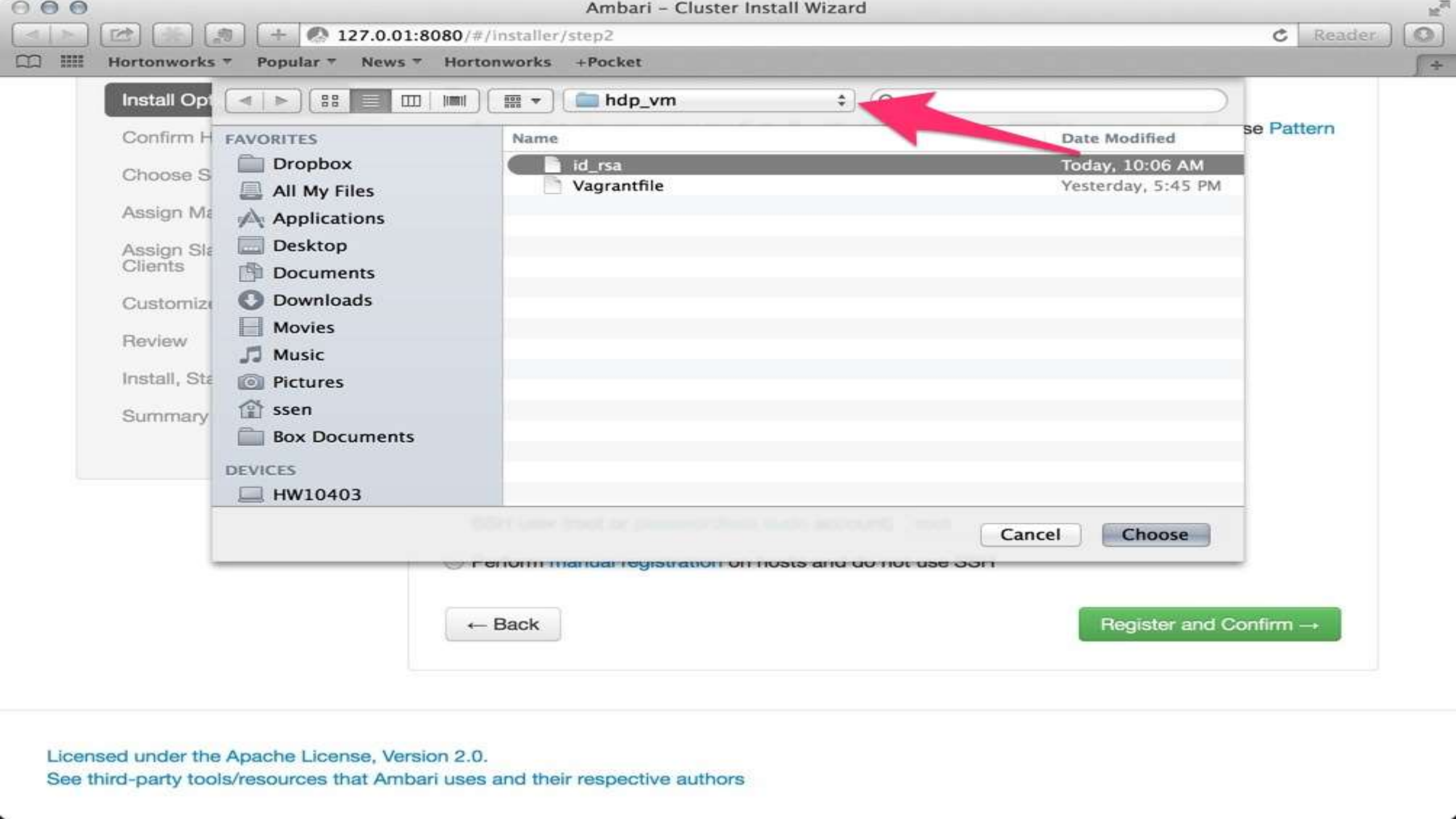
Provide your [SSH Private Key](#) to automatically register hosts

no file selected

```
-----BEGIN RSA PRIVATE KEY-----  
MIIEogIBAAKCAQEA5M2...l1dqm0ijAcq81KnoMX9PQ6U6ydlnVeIPpdTFyTqvBM  
r
```

SSH user (root or [passwordless sudo account](#))

Perform [manual registration](#) on hosts and do not use SSH



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See [third-party tools/resources](#) that Ambari uses and their respective authors

Setup Ambari

## Pseudo-cluster with Ambari (cont.)

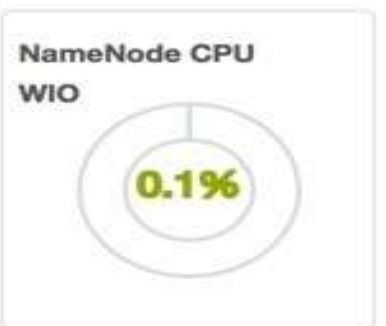
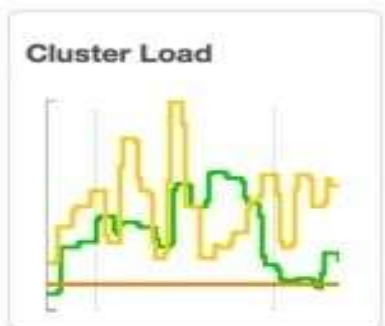
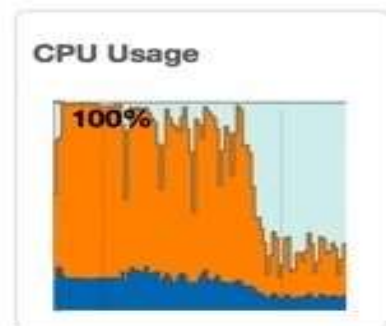
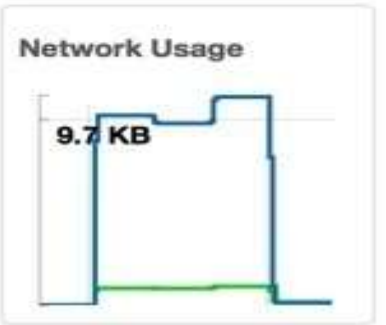
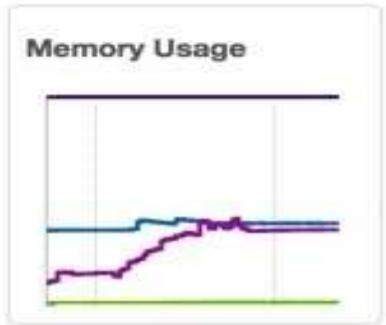
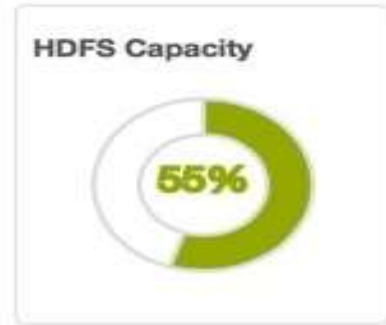
- ▶ Finish the wizard.
- ▶ And now we have our Hadoop VM installed.



Dashboard Heatmaps Services Hosts Admin

- HDFS
- YARN
- MapReduce2
- HBase
- Hive
- WebHCat
- Oozie
- Ganglia
- Nagios
- ZooKeeper

Cluster Status and Metrics + Add



감사합니다  
Thank You