

Building a Hadoop Cluster on Amazon EC2 using Cloudera

April 2013

<http://randyzwitch.com/big-data-hadoop-amazon-ec2-cloudera-part-2>

Create Name Node: m1.large

Ubuntu Server 12.04.1 LTS 64-bit

Create a New Instance

Cancel

Select an option below:

Classic Wizard

Launch an On-Demand or Spot instance using the classic wizard with fine-grained control over how it is launched.

Quick Launch Wizard

Launch an On-Demand instance using an editable, default configuration so that you can get started in the cloud as quickly as possible.

AWS Marketplace

AWS Marketplace is an online store where you can find and buy software that runs on AWS. Launch with 1-Click and pay by the hour.

Submit Feedback

Getting Started Guide

Launch with the Classic Wizard

Request Instances Wizard

Cancel

CHOOSE AN AMI

INSTANCES

Provide the details for your instance(s). You may also decide whether you want to launch your instances as "on-demand" or "spot" instances.

Number of Instances: 1 Instance Type: M1 Large (m1.large, 7.5 GiB)

Launch as an EBS-Optimized instance (additional charges apply):

Launch Instances

EC2 Instances let you pay for compute capacity by the hour, converting commonly large fixed costs into much smaller variable costs.

Launch into: EC2-Classical EC2-VPC

Availability Zone: No

Request Spot Instances

Back

Continue

Request Instances Wizard

Cancel

CHOOSE AN AMI

INSTANCES

Create Key Pair

Configure Firewall

Review

Add tags to your instance to simplify the administration of your EC2 infrastructure. A form of metadata, tags consist of a case-sensitive key/value pair, are stored in the cloud and are private to your account. You can create user-friendly names that help you organize, search, and browse your resources. For example, you could define a tag with key = Name and value = Webserver. You can add up to 10 unique keys to each instance along with an optional value for each key. For more information, go to [Tagging Your Amazon EC2 Resources](#) in the *EC2 User Guide*.

Key (127 characters maximum)	Value (255 characters maximum)	Remove
Cloudera	NameNode	✖
		✖

Add another Tag. (Maximum of 10)

Back

Continue

Create Name Node: m1.large

Can use defaults for most Wizard screens except Firewall

Request Instances Wizard

Cancel

CHOOSE AN AMI

INSTANCE DETAILS

CREATE KEY PAIR

CONFIGURE FIREWALL

REVIEW

Security groups determine whether a network port is open or blocked on your instances. You may use an existing security group, or we can help you create a new security group to allow access to your instances using the suggested ports below. Add additional ports now or update your security group anytime using the Security Groups page.

☐ Choose one or more of your existing Security Groups

☒ Create a new Security Group

Group Name

ClouderaManager

Group Description

Inbound Rules

Create a new rule:

Custom TCP rule

Port range:

(e.g., 80 or 49152-65535)

Source:

0.0.0.0/0

(e.g., 192.168.2.0/24, sg-47ad482e, or 1234567890/default)

+ Add Rule

ICMP

Port (Service)	Source	Action
ALL	0.0.0.0/0	Delete

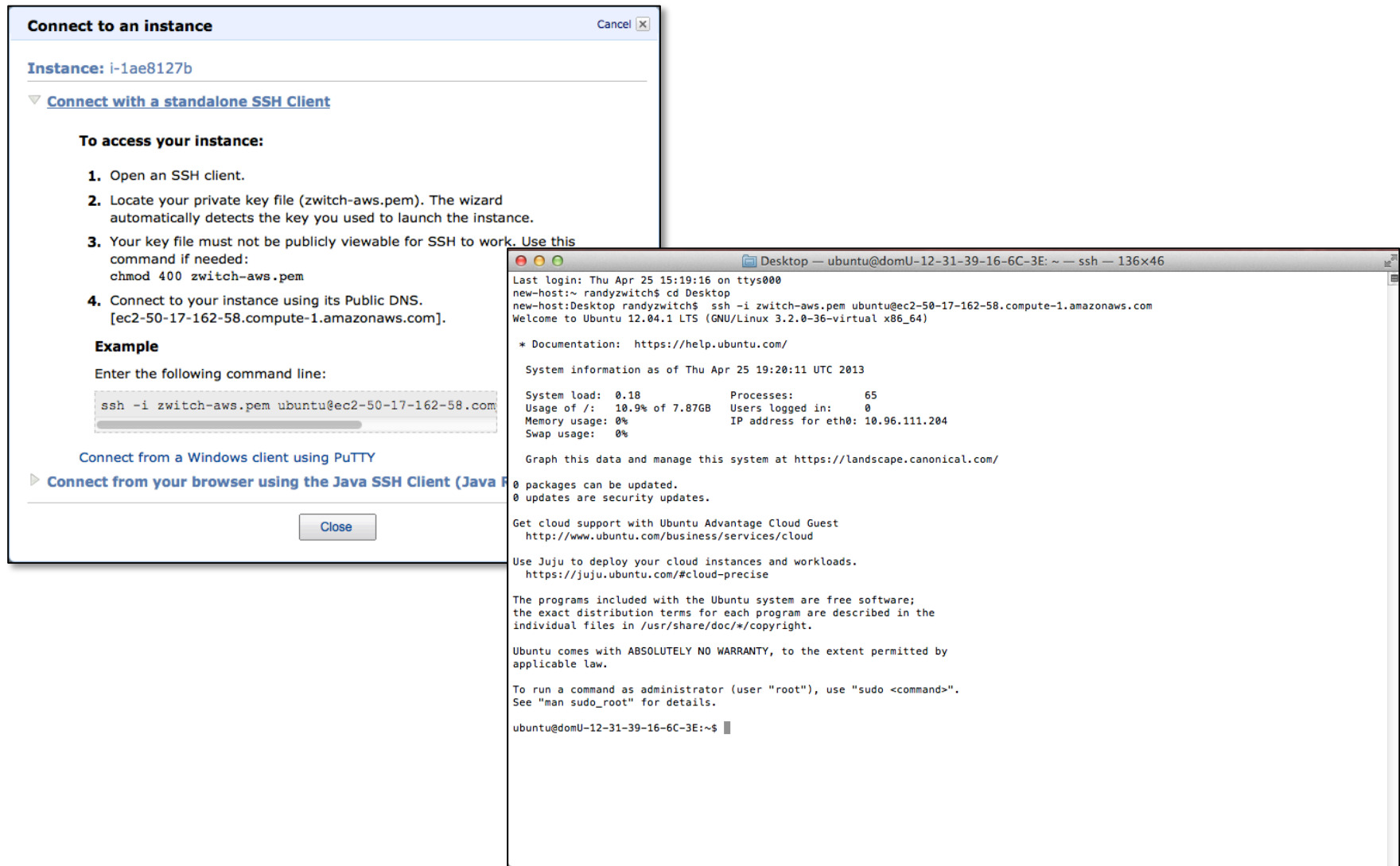
TCP

Port (Service)	Source	Action
22 (SSH)	0.0.0.0/0	Delete
7180	0.0.0.0/0	Delete
7182 - 7183	0.0.0.0/0	Delete
7432	0.0.0.0/0	Delete

< Back

Continue >

Launch Instance, Connect Via SSH



Download & Run Cloudera Manager

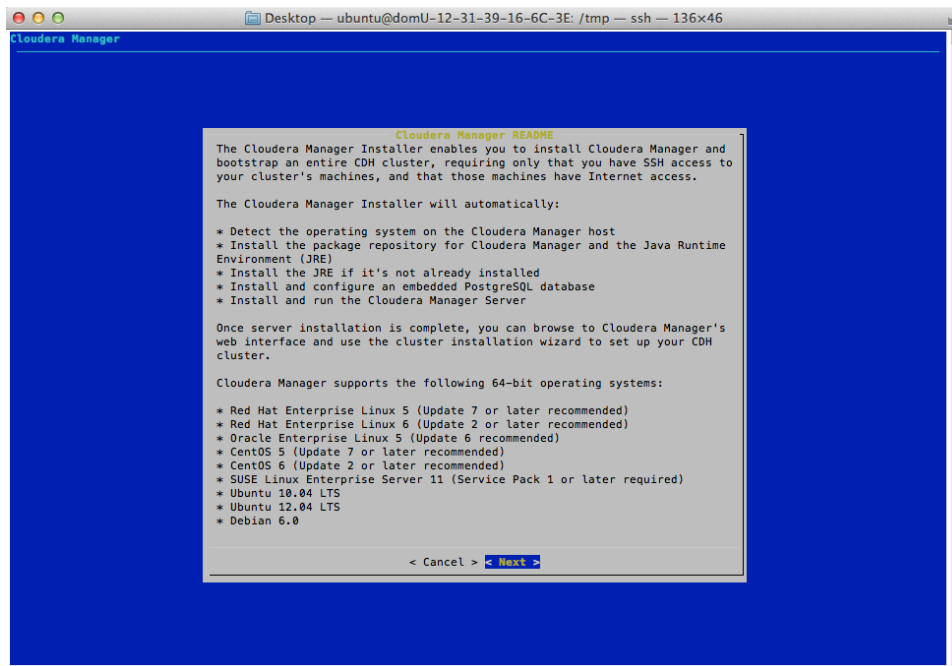
Depending on settings, might need to run as “sudo”

```
ubuntu@domU-12-31-39-16-6C-3E:~$ cd /tmp
ubuntu@domU-12-31-39-16-6C-3E:/tmp$ wget http://archive.cloudera.com/cm4/installer/latest/cloudera-manager-installer.bin
--2013-04-25 19:24:44-- http://archive.cloudera.com/cm4/installer/latest/cloudera-manager-installer.bin
Resolving archive.cloudera.com (archive.cloudera.com)... 184.73.217.71
Connecting to archive.cloudera.com (archive.cloudera.com)|184.73.217.71|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 501701 (490K) [application/octet-stream]
Saving to: `cloudera-manager-installer.bin'

100%[=====] 501,701 --.-K/s in 0.02s

2013-04-25 19:24:44 (19.9 MB/s) - `cloudera-manager-installer.bin' saved [501701/501701]

ubuntu@domU-12-31-39-16-6C-3E:/tmp$ chmod +x cloudera-manager-installer.bin
ubuntu@domU-12-31-39-16-6C-3E:/tmp$ ./cloudera-manager-installer.bin
```

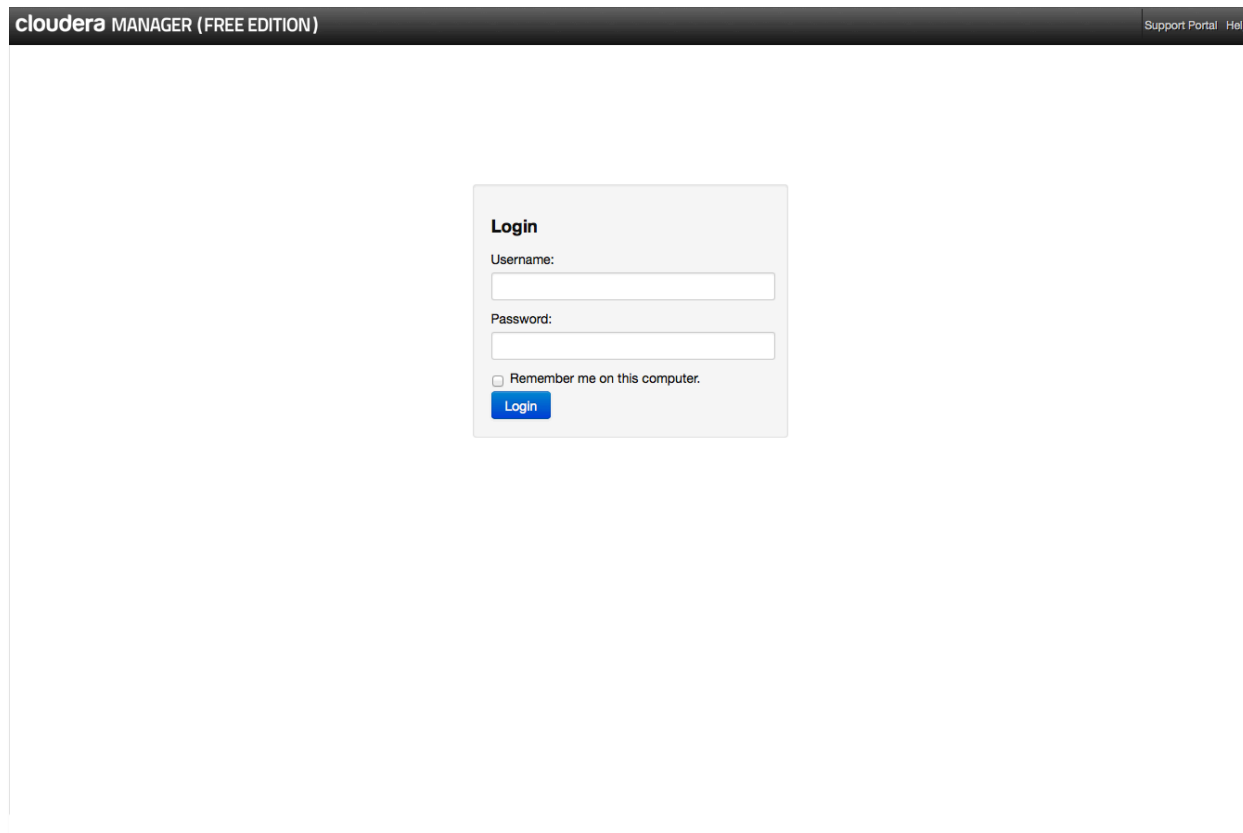


Might take 5 or so minutes to go through licensing and installation menus

Open browser And Go To EC2 Instance Public
DNS At Port 7180

Ex: *http://ec2-50-17-162-58.compute-1.amazonaws.com:7180*

On this first login, you set your username and password credentials



The screenshot shows the Cloudera Manager (Free Edition) login interface. The title bar at the top reads "cloudera MANAGER (FREE EDITION)" and includes links for "Support Portal" and "Help". The main content area is a light gray box with a "Login" section. This section contains a "Username:" label followed by a text input field, a "Password:" label followed by a text input field, a checkbox labeled "Remember me on this computer.", and a blue "Login" button.

Use Defaults, '18' for instances

cloudera MANAGER (FREE EDITION)

SupportHelpadmin

Provide instance specifications

📘 Your CDH cluster will be automatically installed at this location: U.S. East (Virginia) [Learn more](#)

Operating system [Learn more](#)

☒ Select from a list of operating systems

Ubuntu 12.04 LTS (Amazon Machine Image ID: ami-3c994355)

☐ Enter an image ID and username directly

Image ID Username

Instance Type [Learn more](#)

m1.medium

Number of instances to add to cluster

18

Group name for your instances (optional) [Learn more](#)

cloudera-cdh

Back

123456789

Continue

Type In AWS Access Key ID & Secret Access Key

Credentials can be found under “Security Credentials” in EC2 dashboard

The image shows two overlapping screenshots. The background screenshot is the AWS Management Console, specifically the EC2 dashboard. It displays a list of instances with columns for Name, Instance, AMI ID, Root Device, Type, State, Status Checks, and Alarm. A dropdown menu is open for the 'Security Credentials' link in the top right corner. The foreground screenshot is the Cloudera Manager (Free Edition) 'Provide credentials' screen. It prompts the user to enter their AWS Access Key ID and Secret Access Key, with a 'Test Credentials' button. Below this, it provides instructions on how to generate new credentials in the AWS IAM console. At the bottom, it asks for the 'Instance authentication method', with options to let Cloudera generate a key pair or upload an RSA private key (selected). A 'Passphrase' field is also present.

cloudera MANAGER (FREE EDITION)

Provide credentials.

This connection is not encrypted. Cloudera strongly recommends using a secure TLS connection. [Set it here.](#)

AWS Access Key ID and Secret Access Key [Learn more](#)

AKIAJGNO [REDACTED]

.....

Test Credentials ✓ Credentials are valid.

To generate new credentials (Amazon Web Services Account permissions needed)

1. Go to <https://console.aws.amazon.com/iam/>
2. Click users
3. Check the box next to the desired user, scroll down and click Manage Access Keys
4. Copy the new keys and paste them above

Instance authentication method [Learn more](#)

☐ Let Cloudera generate a key pair for your hosts

☒ Upload your own RSA private key (PEM format)

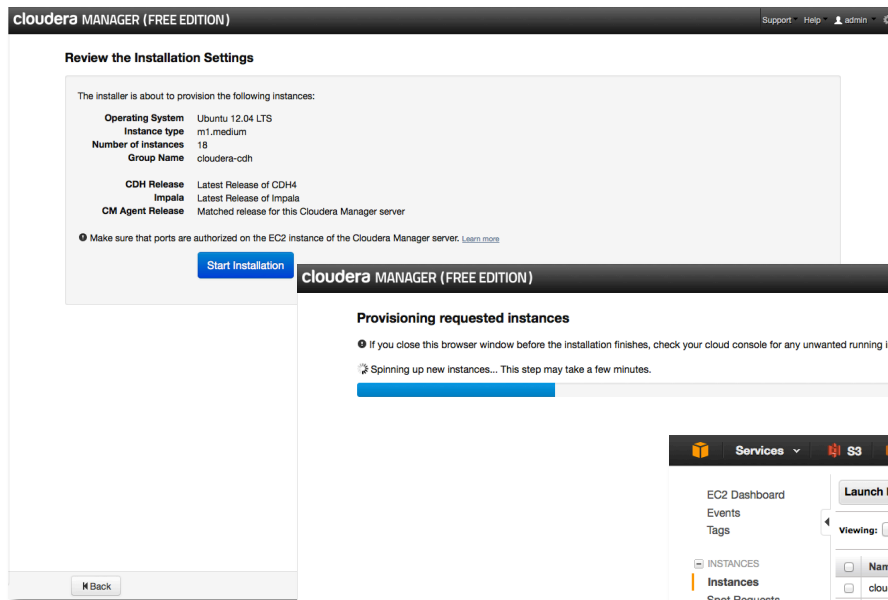
/Users/randyzwitch/Desktop **Browse...**

Passphrase

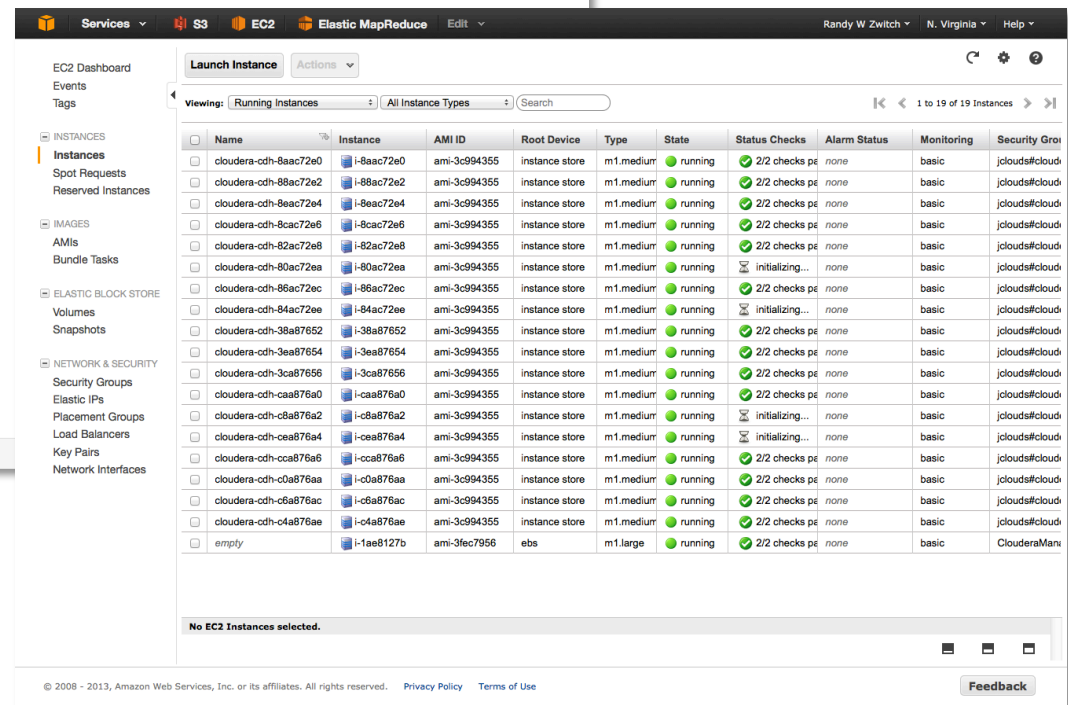
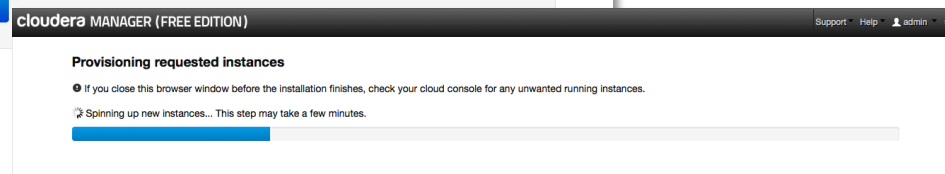
Back 1 2 3 4 5 6 7 8 9 **Continue**

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Review Settings Then Install!



Provisioning Instances will take a few minutes



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If Any Installations Fail, Retry Until Success

cloudera MANAGER (FREE EDITION) Support Help admin

Installation in progress.

0 of 18 host(s) completed successfully. [Abort Installation](#)

Installation failed on 1 host(s). [Uninstall Failed Hosts](#) [Retry Failed Hosts](#)

Hostname	IP Address	Progress	Status
ip-10-138-0-189.ec2.internal	10.138.0.189		
ip-10-151-104-2.ec2.internal	10.151.104.2		
ip-10-137-55-91.ec2.internal	10.137.55.91		
ip-10-151-103-133.ec2.internal	10.151.103.133		
ip-10-151-99-171.ec2.internal	10.151.99.171		
ip-10-151-90-103.ec2.internal	10.151.90.103		
ip-10-138-1-149.ec2.internal	10.138.1.149		
ip-10-141-162-39.ec2.internal	10.141.162.39		
ip-10-151-20-14.ec2.internal	10.151.20.14		
ip-10-137-54-233.ec2.internal	10.137.54.233		
ip-10-151-62-79.ec2.internal	10.151.62.79		
ip-10-137-30-181.ec2.internal	10.137.30.181		

cloudera MANAGER (FREE EDITION) Support Help admin

Installation completed successfully.

18 of 18 host(s) completed successfully.

Hostname	IP Address	Progress	Status
ip-10-138-0-189.ec2.internal	10.138.0.189		✓ Installation completed successfully. Details
ip-10-151-104-2.ec2.internal	10.151.104.2		✓ Installation completed successfully. Details
ip-10-137-55-91.ec2.internal	10.137.55.91		✓ Installation completed successfully. Details
ip-10-151-103-133.ec2.internal	10.151.103.133		✓ Installation completed successfully. Details
ip-10-151-99-171.ec2.internal	10.151.99.171		✓ Installation completed successfully. Details
ip-10-151-90-103.ec2.internal	10.151.90.103		✓ Installation completed successfully. Details
ip-10-138-1-149.ec2.internal	10.138.1.149		✓ Installation completed successfully. Details
ip-10-141-162-39.ec2.internal	10.141.162.39		✓ Installation completed successfully. Details
ip-10-151-20-14.ec2.internal	10.151.20.14		✓ Installation completed successfully. Details
ip-10-137-54-233.ec2.internal	10.137.54.233		✓ Installation completed successfully. Details
ip-10-151-62-79.ec2.internal	10.151.62.79		✓ Installation completed successfully. Details
ip-10-137-30-181.ec2.internal	10.137.30.181		✓ Installation completed successfully. Details
ip-10-141-134-107.ec2.internal	10.141.134.107		✓ Installation completed successfully. Details
ip-10-137-11-89.ec2.internal	10.137.11.89		✓ Installation completed successfully. Details

[Back to Installation Settings](#) [Continue](#)

<http://randyzwitch.com/big-data-hadoop-amazon-ec2-cloudera-part-2>

Make Sure Consistency Check Passes

cloudera MANAGER (FREE EDITION)

Support Help admin

Inspect hosts for correctness

Validations

- ✓ Inspector ran on all 18 hosts.
- ✓ Individual hosts resolved their own hostnames correctly.
- ✓ No errors were found while looking for conflicting init scripts.
- ✓ No errors were found while checking /etc/hosts.
- ✓ All hosts resolved localhost to 127.0.0.1.
- ✓ All hosts checked resolved each other's hostnames correctly.
- ✓ Host clocks are approximately in sync (within ten minutes).
- ✓ Host time zones are consistent across the cluster.
- ✓ No users or groups are missing.
- ✓ No kernel versions that are known to be bad are running.
- ✓ 0 hosts are running CDH3 and 18 hosts are running CDH4.
- ✓ All checked hosts are running the same version of components.
- ✓ All checked Cloudera Management Daemons versions are consistent with the server.
- ✓ All checked Cloudera Management Agents versions are consistent with the server.

Version Summary

Group 1 (CDH4)

Hosts

ip-10-136-6-55.ec2.internal, ip-10-137-11-89.ec2.internal, ip-10-137-30-181.ec2.internal, ip-10-137-54-233.ec2.internal, ip-10-137-54-250.ec2.internal, ip-10-137-55-91.ec2.internal, ip-10-138-0-189.ec2.internal, ip-10-138-1-149.ec2.internal, ip-10-141-134-107.ec2.internal, ip-10-141-162-39.ec2.internal, ip-10-151-103-133.ec2.internal, ip-10-151-104-2.ec2.internal, ip-10-151-20-14.ec2.internal, ip-10-151-62-79.ec2.internal, ip-10-151-87-20.ec2.internal, ip-10-151-90-103.ec2.internal, ip-10-151-99-171.ec2.internal, ip-10-190-94-59.ec2.internal

Component	Version	CDH Version
Impala	0.7	Not applicable
HDFS (CDH4 only)	2.0.0+960	CDH4
Hue Plugins	2.2.0+194	CDH4
MapReduce 2 (CDH4 only)	2.0.0+960	CDH4
HBase	0.94.2+218	CDH4

1 2 3 4 5 6 7 8 9

Run Again Continue

Cluster Services Will Start, Then Success!

The image displays two screenshots from the Cloudera Manager (FREE EDITION) interface. The left screenshot, titled "Starting your cluster services," shows a progress bar at 18 of 18 steps completed. Below the bar is a list of 18 tasks, each marked with a green checkmark and a status of "Service started successfully." The tasks include waiting for ZooKeeper, starting ZooKeeper, checking and formatting HDFS, starting HDFS, creating HDFS directories, creating HBase root directory, starting HBase and MapReduce services, creating Hive Metastore Database and Tables, creating Hive warehouse directory, starting Hive service, creating Oozie database, installing Oozie ShareLib, and starting Oozie service. The right screenshot, titled "Congratulations!", displays the message: "The Hadoop services are installed, configured, and running on your cluster." A "Continue" button is located at the bottom right of this window.

cloudera MANAGER (FREE EDITION) Support Help admin

Starting your cluster services.

Completed 18 of 18 steps.

- ✓ Waiting for ZooKeeper Service to initialize
Finished waiting
- ✓ Starting ZooKeeper Service
Service started successfully.
- ✓ Checking if the name directories of the NameNode are empty. Formatting HDFS only if empty.
Successfully formatted NameNode.
- ✓ Starting HDFS Service
Service started successfully.
- ✓ Creating HDFS /tmp directory
Successfully created HDFS directory /tmp.
- ✓ Creating HBase root directory
Successfully created HBase root directory.
- ✓ Starting HBase Service
Service started successfully.
- ✓ Starting MapReduce Service
Service started successfully.
- ✓ Creating Hive Metastore Database
Created Hive Metastore Database.
- ✓ Creating Hive Metastore Database Tables
Created Hive Metastore Database Tables successfully.
- ✓ Creating Hive warehouse directory
Successfully created Hive warehouse directory.
- ✓ Starting Hive Service
Service started successfully.
- ✓ Creating Oozie database
Oozie database created successfully.
- ✓ Installing Oozie ShareLib in HDFS
Successfully installed Oozie ShareLib
- ✓ Starting Oozie Service
Service started successfully.

cloudera MANAGER (FREE EDITION) Support Help admin

Congratulations!

The Hadoop services are installed, configured, and running on your cluster.

Continue

Finding Hue Public DNS

Hue (Hadoop User Experience) is the more user-friendly way to interact with Hadoop

The screenshot displays the Cloudera Manager (FREE EDITION) interface. The top navigation bar includes 'Services' and 'Hosts' tabs, a search bar, and user information (admin). The main content area is titled 'All Services' and shows 'Cluster 1 - CDH4'. A dropdown menu is open, listing services: hbase1, hdfs1, hive1, hue1 (highlighted), impala1, mapreduce1, oozie1, and zookeeper1. The main table shows the status of these services.

Name	Status	Health	Role Count
hbase1	Started	Good	17 Regions
hdfs1	Started	Good	1 Secondary
hive1	Started	Good	1 Hive Metastore
hue1	Started	Good	1 Beeswax
impala1	Started	Good	17 Impala Daemons, 1 Impala Statestore Daemon
mapreduce1	Started	Good	1 JobTracker, 17 TaskTrackers
oozie1	Started	Good	1 Oozie Server
zookeeper1	Started	Good	1 Server

Finding Hue Public DNS

Clicking on the “Hue Web UI” button doesn’t work, because it references the Internal Address for Amazon EC2

The screenshot shows the Cloudera Manager interface for the 'hue1' service. The 'Hue Web UI' button is highlighted with a red box and a red arrow pointing to it with the text 'Clicking this link button won't work!'. A green arrow points from the 'Hue Web UI' button to a box containing the internal IP address 'ip-10-136-6-55.ec2.internal:8888'. A blue arrow points from this box to the text 'Need to find the Public DNS for this Internal Address in Amazon Dashboard'.

cloudera MANAGER (FREE EDITION) Services Hosts Search

Services hue1 Currently Started with Good Health Actions

Status Instances Commands Configuration Audits Hue Web UI

Status and Health Summary

	Status	Health
Hue Server	✓ Started	✓ Good
Beeswax Server	✓ Started	✓ Good

ip-10-136-6-55.ec2.internal:8888

Need to find the Public DNS for this Internal Address in Amazon Dashboard

Finding Hue Public DNS

Type in Internal Address in Search Box to find the Instance having Hue

ip-10-136-6-55.ec2.internal:8888

The screenshot shows the AWS Management Console interface. The top navigation bar includes 'Services', 'S3', 'EC2', and 'Elastic MapReduce'. The left sidebar shows the 'EC2 Dashboard' with links to 'Events' and 'Tags'. The main content area displays a list of EC2 instances. The instance 'cloudera-cdh-3ea87654' is selected. The details for this instance are shown below the table. The 'Public DNS' field is highlighted with a green box, and a green arrow points to it from the text 'This is the public DNS Address to access Hue'.

Name	Instance	AMI ID	Root Device	Type	State	Status Checks	Alarm Status	Monitoring	Security Groups
cloudera-cdh-3ea87654	i-3ea87654	ami-3c994355	instance store	m1.medium	running	2/2 checks passed	none	basic	jclouds#cloud

1 EC2 Instance selected.

EC2 Instance: cloudera-cdh-3ea87654 (i-3ea87654)

ec2-54-224-118-78.compute-1.amazonaws.com

Description	Status Checks	Monitoring	Tags
AMI: ubuntu/images/ubuntu-precise-12.04-amd64-server-20120424 (ami-3c994355) Zone: us-east-1d Type: m1.medium Scheduled Events: No scheduled events VPC ID: - Source/Dest. Check: - Placement Group: - RAM Disk ID: - Key Pair Name: jclouds#cloudera-cdh#9c6 Monitoring: basic Elastic IP: - Root Device Type: instance store IAM Role: - EBS Optimized: false Block Devices: - Network Interfaces: - Public DNS: ec2-54-224-118-78.compute-1.amazonaws.com	Alarm Status: none Security Groups: jclouds#cloudera-cdh. view rules State: running Owner: 432748329231 Subnet ID: - Virtualization: paravirtual Reservation: r-6a4b7705 Platform: - Kernel ID: aki-825ea7eb AMI Launch Index: 16 Root Device: - Tenancy: default Lifecycle: normal		

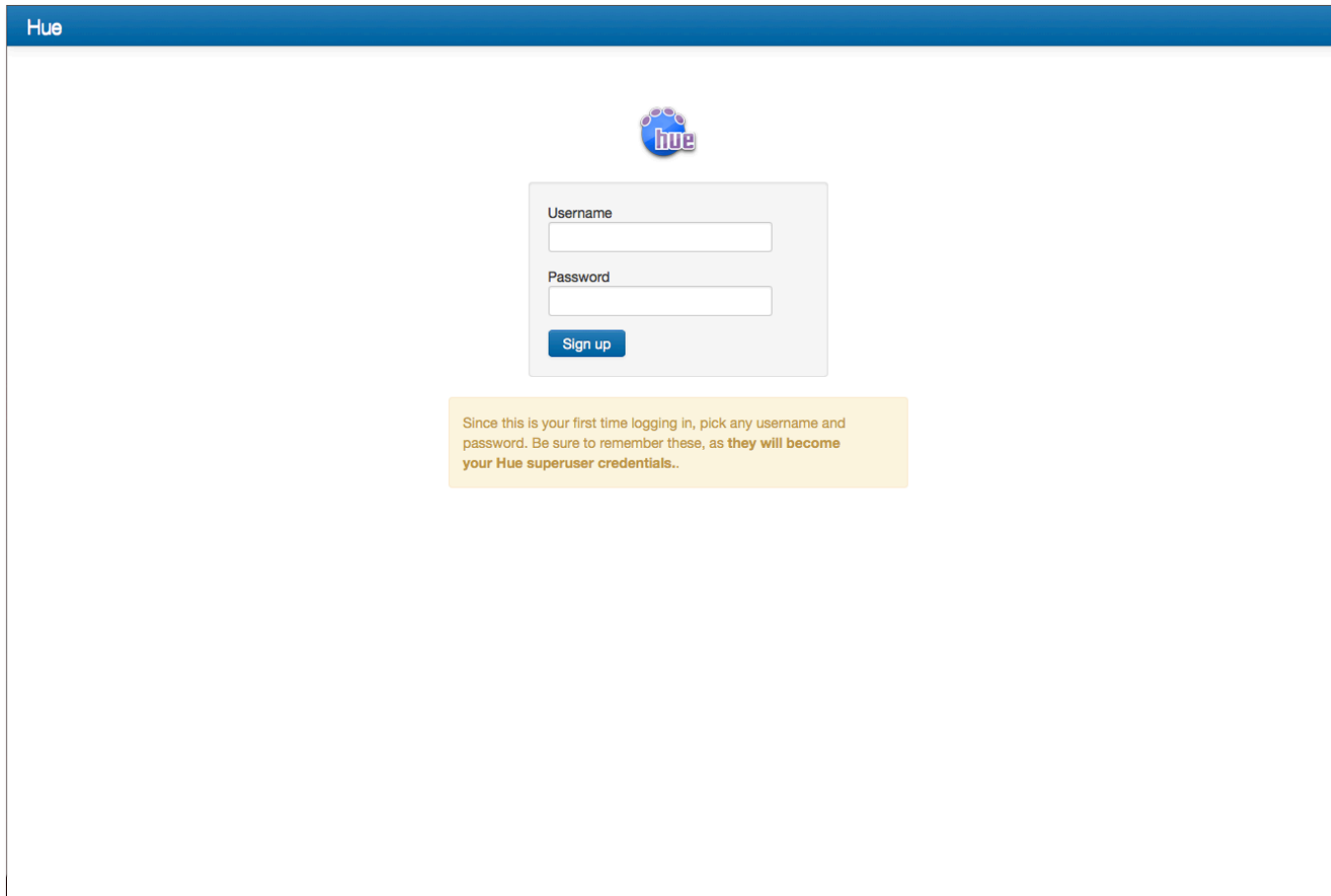
This is the public DNS Address to access Hue

Finding Hue Public DNS

Hue is accessed via Port 8888

Ex: *http://ec2-54-224-118-78.compute-1.amazonaws.com:8888*

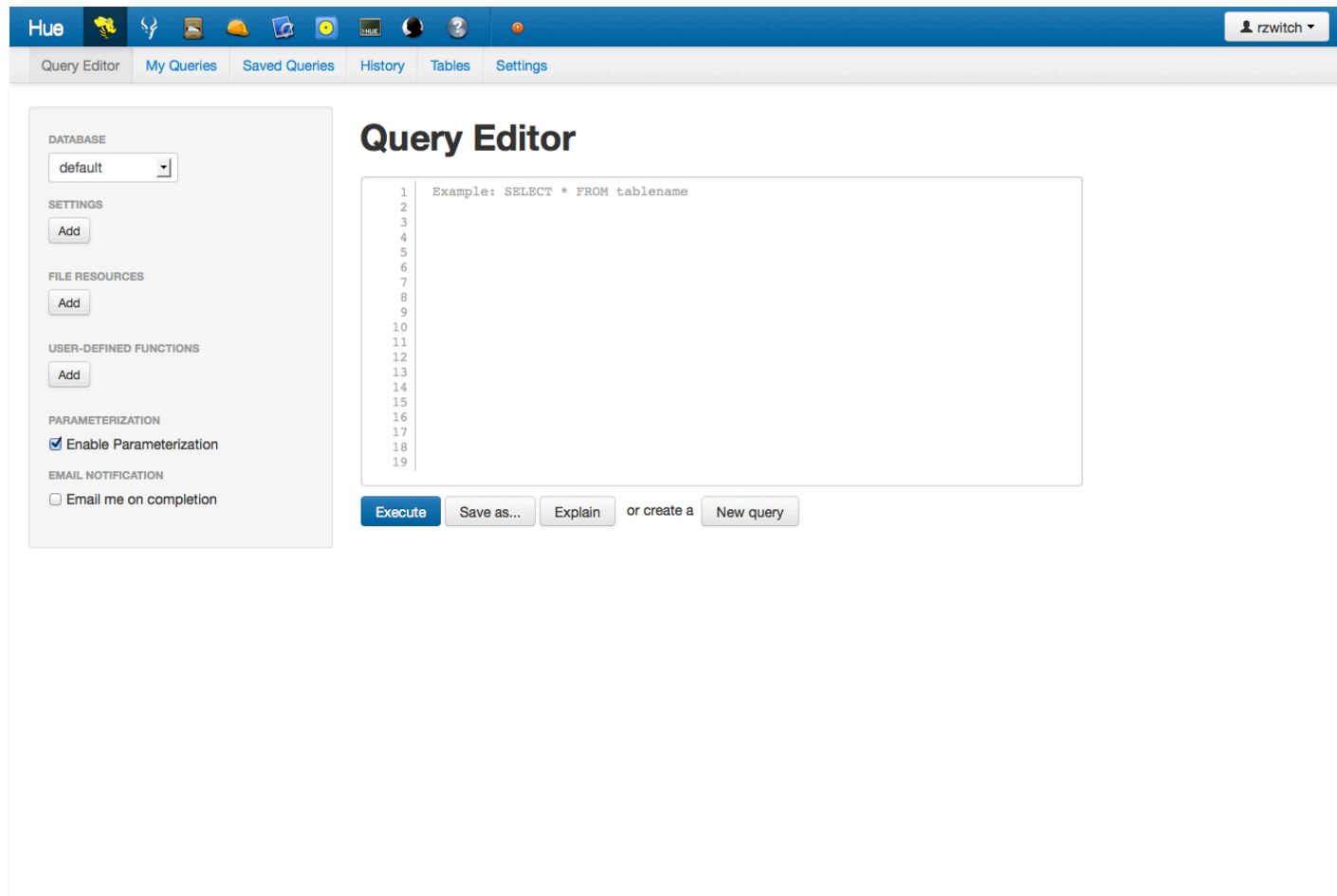
Pick your username/password carefully, this is the superuser



The screenshot shows the Hue web interface. At the top is a blue header with the word "Hue". Below the header is a large white area. In the center of this area is a login form. The form has a blue "hue" logo at the top. Below the logo are two input fields: "Username" and "Password". Below the "Password" field is a blue "Sign up" button. Below the form is a yellow box with text: "Since this is your first time logging in, pick any username and password. Be sure to remember these, as they will become your Hue superuser credentials..".

If You See Hue, You're Ready For Analysis!

This is the Hive editor, which allows for SQL-Like Syntax to create MapReduce jobs



Reference

<http://blog.cloudera.com/blog/2013/03/how-to-create-a-cdh-cluster-on-amazon-ec2-via-cloudera-manager/>

The screenshot shows the Cloudera website's blog page. The header includes navigation links for Cloudera.com, Cloudera University, Documentation, Developer Community, Sign In, Register, Contact Us, and DOWNLOADS. A search bar is located on the right. Below the header, a secondary navigation bar lists categories: WHY CLOUDERA, PRODUCTS, SOLUTIONS, PARTNERS, RESOURCES, SUPPORT, and ABOUT. The left sidebar contains a list of links: Hadoop & Big Data, Our Customers, FAQs, Blog (highlighted), Avro (16), Bigtop (3), Books (4), Careers (14), CDH (86), Cloud (5), Cloudera Life (1), Cloudera Manager (38), Cloudera's Service And Configuration Manager (9), Community (128), Connector (6), Data Collection (16), Data Science (15), DevOps (8), and Distribution (36). The main content area features the article title "How-to: Create a CDH Cluster on Amazon EC2 via Cloudera Manager" by Emanuel Buzek, dated March 26, 2013, with 14 comments, 32 tweets, and 1 like. The article text describes the new express installation wizard for Amazon Web Services (AWS) EC2 in Cloudera Manager 4.5, which enables users to provision CDH clusters and Cloudera Impala on EC2. It highlights that the wizard can launch and configure instances, authorize SSH keys, and configure a firewall. The article also lists what can be done with the Cloud Express Wizard (provisioning new EC2 instances, choosing between CentOS and Ubuntu images, and installing the latest CDH, Impala, and Cloudera Manager agent packages) and what cannot be done (using pre-existing EC2 instances or older versions of CDH and Cloudera Manager). The article concludes with "Step 1: Install Cloudera Manager Server on EC2", which involves launching an EC2 instance for the Cloudera Manager server, requiring an AWS Access Key ID and AWS Secret Key. The instructions specify launching an EC2 instance in the AWS web console, selecting the "Instances" menu, choosing the EC2 region (e.g., "N. Virginia (us-east-1)"), clicking "Launch Instance", and selecting the "Classic Wizard". The article also mentions selecting the "Ubuntu Server 12.04 LTS" 64-bit image and proceeding to the "Create Key Pair" page.

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How-to: Create a CDH Cluster on Amazon EC2 via Cloudera Manager

by Emanuel Buzek | March 26, 2013 | 14 comments | [Tweet](#) 32 | [Like](#)

Cloudera Manager 4.5 includes a new express installation wizard for Amazon Web Services (AWS) EC2. (This feature is also available in Cloudera Manager Free Edition.) Its goal is to enable Cloudera Manager users to provision CDH clusters and Cloudera Impala (the new open source distributed query engine for Apache Hadoop) on EC2 as easily as possible - and thus is currently the fastest way to provision a Cloudera Manager-managed cluster in EC2.

The new distinguishing feature is that Cloudera Manager can now launch and configure the instances for you, so you don't have to worry about launching the instances, authorizing SSH keys, and configuring a firewall. All this can now be done from within Cloudera Manager!

Since Cloudera Manager and the nodes running CDH use internal hostnames to communicate, the Cloudera Manager server must run on EC2 as well. In fact, the Cloud Express Wizard only appears when installing Cloudera Manager on EC2.

Here's what you can do with Cloud Express Wizard:

- Provision new EC2 instances (AWS credentials required)
- Choose between CentOS and Ubuntu images (or a custom AMI)
- Choose your EC2 instance type
- Install the most recently released CDH, Cloudera Impala, and Cloudera Manager agent packages on them

And here's what you cannot do:

- Use pre-existing EC2 instances
- Install older (earlier) versions of CDH and Cloudera Manager, or use Parcels

I am excited to show you how this feature works. These instructions will set up a fully configured CDH cluster (all services with embedded PostgreSQL) from scratch in less than 15 minutes.

Step 1: Install Cloudera Manager Server on EC2

First, you will need to launch an EC2 instance for the Cloudera Manager server, which will require an AWS Access Key ID and AWS Secret Key — please follow [these instructions](#) if you need help getting them.

To launch the EC2 instance, go to "EC2" in the AWS web console and select "Instances" in the left menu. Before you provision the instance, select the EC2 region you want your instance to be in (dropdown in top right corner of the web console). For his demo, you can simply use the default "N. Virginia (us-east-1)" region. Click on "Launch Instance" and select the Classic Wizard. On the next page, pick the "Ubuntu Server 12.04 LTS" 64-bit image. You need one instance of type "m1.large." You can keep the default values of other settings and proceed to the "Create Key Pair" page.