2010

Amazon Web Services EC2 & S3

John Jonas

FireAlt

3/2/2010

Table of Contents

Introduction

Part 1: Amazon EC2

What is an Amazon EC2?

Services Highlights

Other Information

Part 2: Amazon Instances

What is an AMI?

What is an Amazon Instance?

Failed or Terminated Instance

Launching an Amazon Instance

Connecting to Amazon Instance

Create PuTTY Private Key (*.ppk)

6 Steps to Connect to Amazon Instance using PuTTY

8 Steps to Connect to Amazon Instance using WinSCP

Part 3: Elastic Block Store (EBS)

What is an EBS Volume?

What is an EBS Snapshot?

How much does it Costs?

Setting up EBS Snapshots

Part 4: Connecting to Amazon S3

What is an Amazon S3?

How much does it costs?

Using Amazon S3 Firefox Organizer (firefox plugin)

7 Steps on uploading file and Editing ACL

What is an ACL?

Why do we need to edit ACL?

Creating a Bucket

Crossdomain Policy

Setting up a crossdomain.xml

Part 5: Elastic IP Address

What is an Amazon Elastic IP Address?

Part 6: Installing Apache with PHP and MySQL (LAMP)

Installing Apache (httpd)

Installing MySQL

Installing PHP

Part 7: MySQL Database

What is a MySQL?

Connecting MySQL Server using PuTTY

Creating a Database using PuTTY

Importing Database using PuTTY

What is a phpMyAdmin?

Installing phpMyAdmin

Part 8: Wordpress

What is a Wordpress?

Advantages of using Wordpress

Installing a Wordpress

Configuring Wordpress

Part 9: Domain Name

What is a DNS?

What is a CNAME?

How to point your subdomain to Amazon S3 Server

Setting up a CNAME in hostmonster Cpanel

1

Amazon EC2

What is an Amazon EC2?

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. It is designed for web-scale computing easier for developers.

Service Highlights

- ✓ Elastic – Amazon EC2 enables you to increase or decrease capacity within minutes, not hours or days. You can commission one, hundreds, or even thousands of server instances simultaneously.
- ✓ Completely Controlled
- ✓ Flexible – You have the choice of multiple instance types, operating systems, and software packages. Amazon EC2 allows you to select a configuration of memory, CPU, instances storage, and the boot partition size that is optimal for your choice of operating and application.
- ✓ Inexpensive – You pay for a very low rate for the compute capacity you actually consume.

Other Information

- Login Access
  - Amazon login access doesn't need any secret key
  - Just your ordinary Amazon account

- Buckets
  - Are simply folders in Amazon S3 Server.
  - If you want to access a certain file in the bucket you can use this URL:
    - http://[bucket].s3.amazonaws.com/[filename]
  - It is important to note that the bucket name is at the beginning of the URL.

- Instances
  - Also know as Virtual Machines / Virtual Servers
  - You have the ability to launch multiple Instances (Virtual Machines)

- Steps on Creating Instances (on AWS Console)
  - Click on "Launch Instances" button
  - First, we'll select an Amazon Machine Image (AMI's)
  - Second, Select Instance
  - Third, Create Key Pair
  - Fourth, Firewall Configuration
  - Fifth, Launch Instance. Done.

2

Amazon Instances

What is an AMI?

An Amazon Machine Image (AMI) is an encrypted machine image that contains all information necessary to boot instances of your operating system and software. For example, an AMI might contain all the software to act as a web server (e.g. Linux, Apache, and web site).

The Amazon EC2 Environment is a virtual server. Each machine or server is represented by a file called AMI - a bundle of preconfigured operating system and possible applications software that will run on EC2 Environment.

What is an Amazon Instance?

An instance is a system running in the Amazon EC2 environment based from your AMI configuration. It is known as Virtual Machine or Virtual Server. You can run up to twenty (20) instances. If you need more instances, you can submit a Request Form for additional instances.

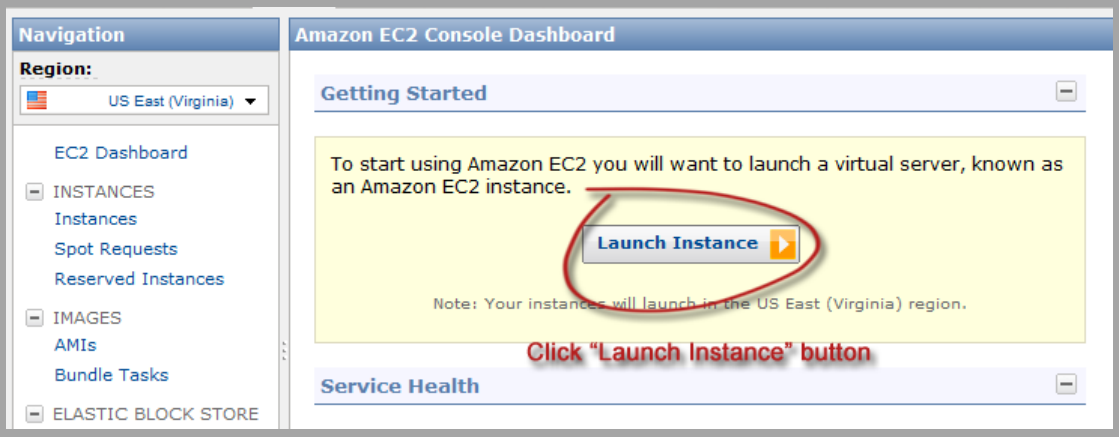
Failed or Terminated Instance

Failed or Terminated Instance will automatically delete all the data in the Server. However, if an Instance fails or terminated that uses an Amazon EBS Volume as its root device, the data will remain available.

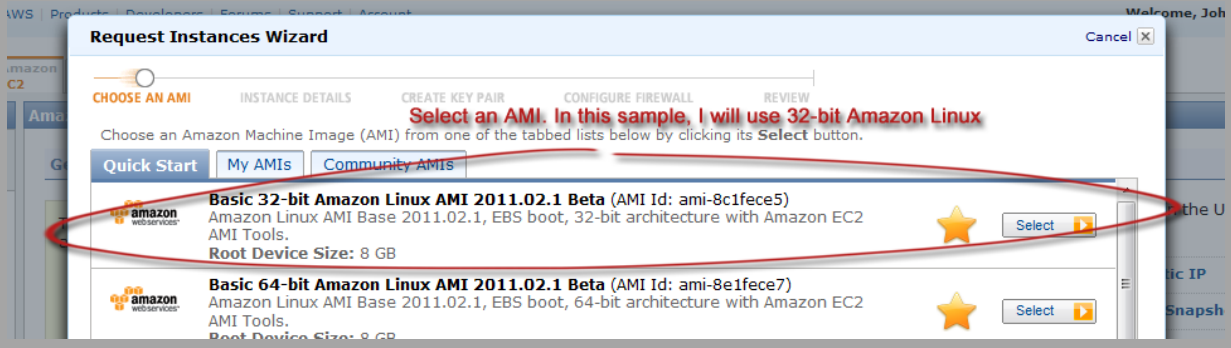
Launching an Amazon Instance

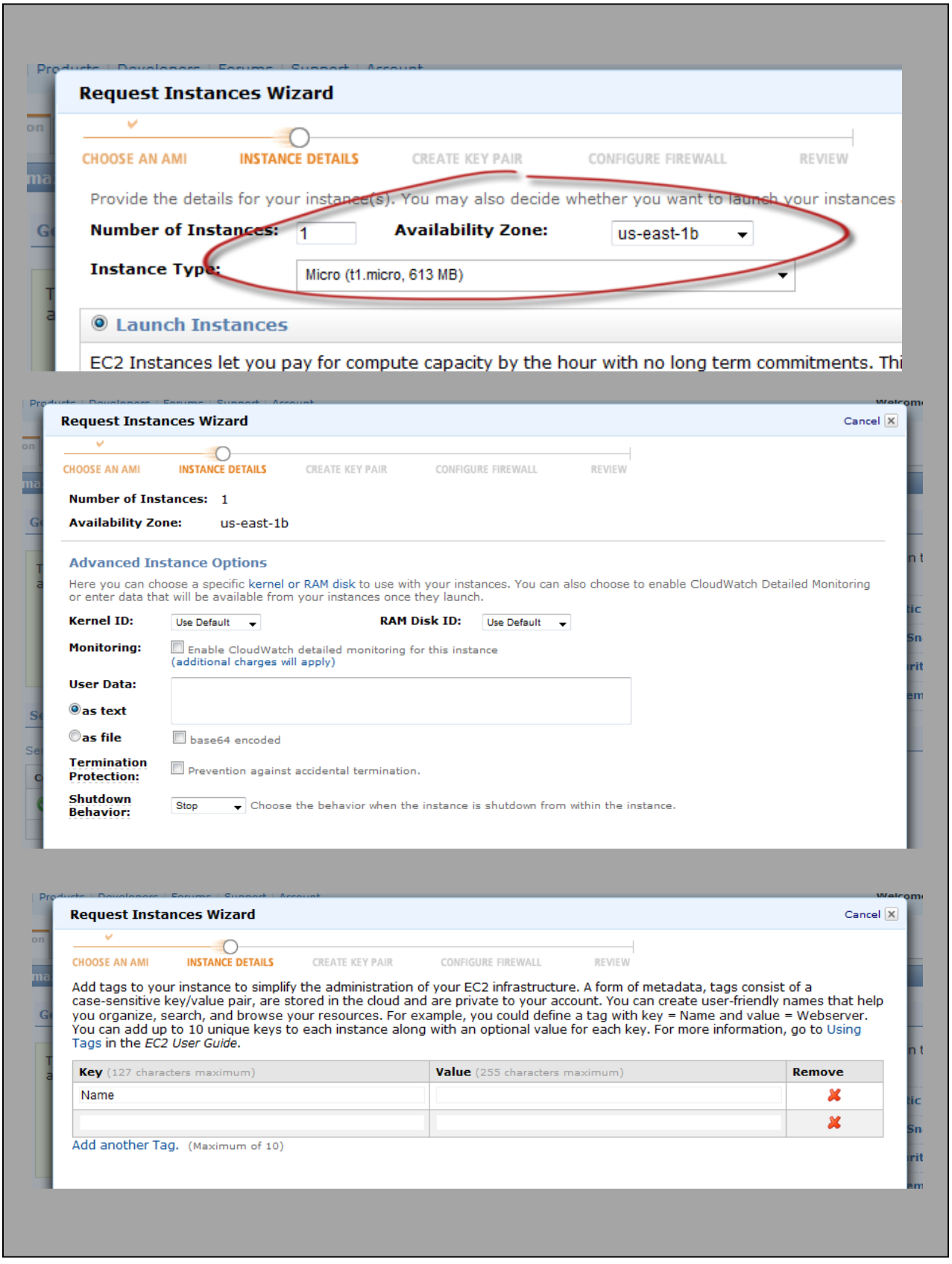
Using AWS EC2 console (https://console.aws.amazon.com/ec2/home) you can create/launch Instances easily. Just follow the simple steps below:

1) Click "*Launch Instance*" Button

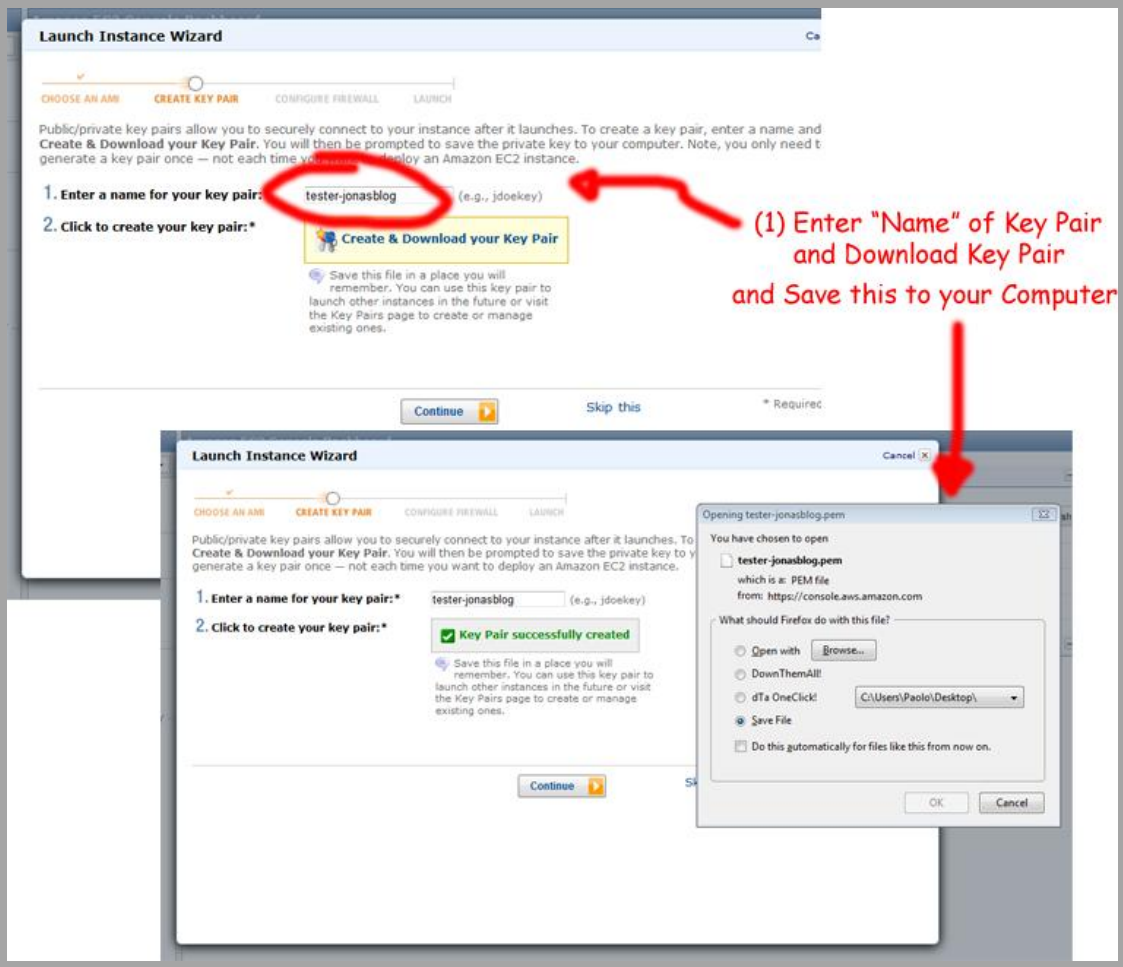


2) *Choose an Amazon Machine Image (AMI)* - a bundle of preconfigured operating system and possible applications software that will run on EC2 Environment.



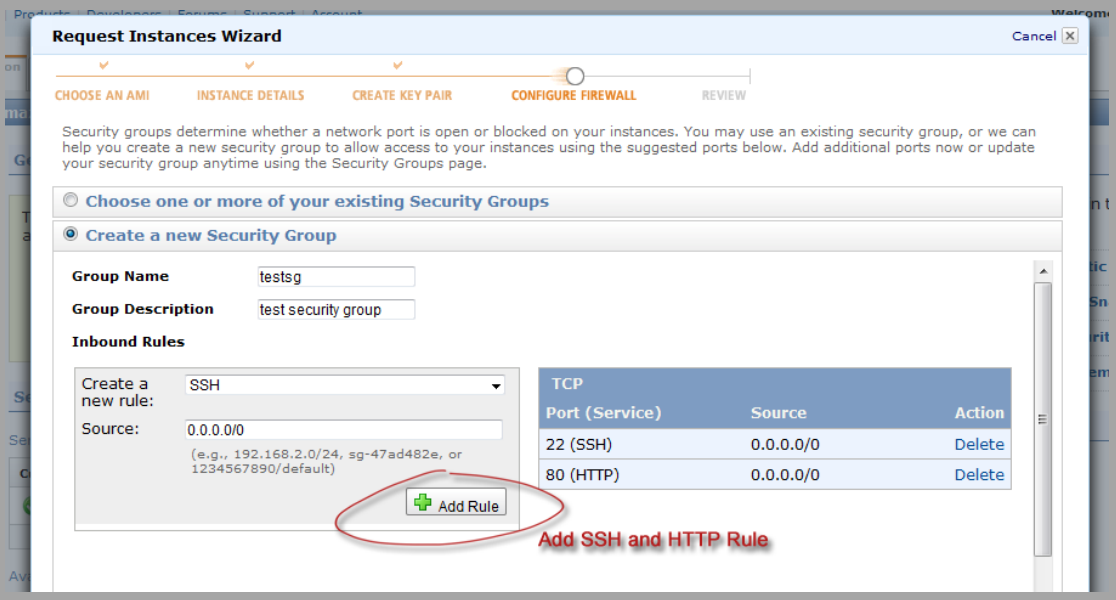

Request Instances Wizard
CHOOSE AN AMI
INSTANCE DETAILS
CREATE KEY PAIR
CONFIGURE FIREWALL
REVIEW
Provide the details for your instance(s). You may also decide whether you want to launch your instances
Number of Instances:
1
Availability Zone:
us-east-1b
Instance Type:
Micro (t1.micro, 613 MB)
Launch Instances
EC2 Instances let you pay for compute capacity by the hour with no long term commitments. Thi
Request Instances Wizard
Cancel
CHOOSE AN AMI
INSTANCE DETAILS
CREATE KEY PAIR
CONFIGURE FIREWALL
REVIEW
Number of Instances: 1
Availability Zone: us-east-1b
Advanced Instance Options
Here you can choose a specific kernel or RAM disk to use with your instances. You can also choose to enable CloudWatch Detailed Monitoring or enter data that will be available from your instances once they launch.
Kernel ID:
Use Default
RAM Disk ID:
Use Default
Monitoring:
Enable CloudWatch detailed monitoring for this instance
(additional charges will apply)
User Data:
as text
as file
base64 encoded
Termination Protection:
Prevention against accidental termination.
Shutdown Behavior:
Stop
Choose the behavior when the instance is shutdown from within the instance.
Request Instances Wizard
Cancel
CHOOSE AN AMI
INSTANCE DETAILS
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 Using Tags in the EC2 User Guide.
Key (127 characters maximum)
Value (255 characters maximum)
Remove
Name
Add another Tag. (Maximum of 10)

3) *Create a Key Pair* - Very useful in connecting to Instance/Virtual Machine securely. You'll going to use this Key Pair later and I'll going to teach how to use it using PuTTY or WinSCP. Just make sure you save this file in a secure place in your drive, you don't want to copy this by some else.

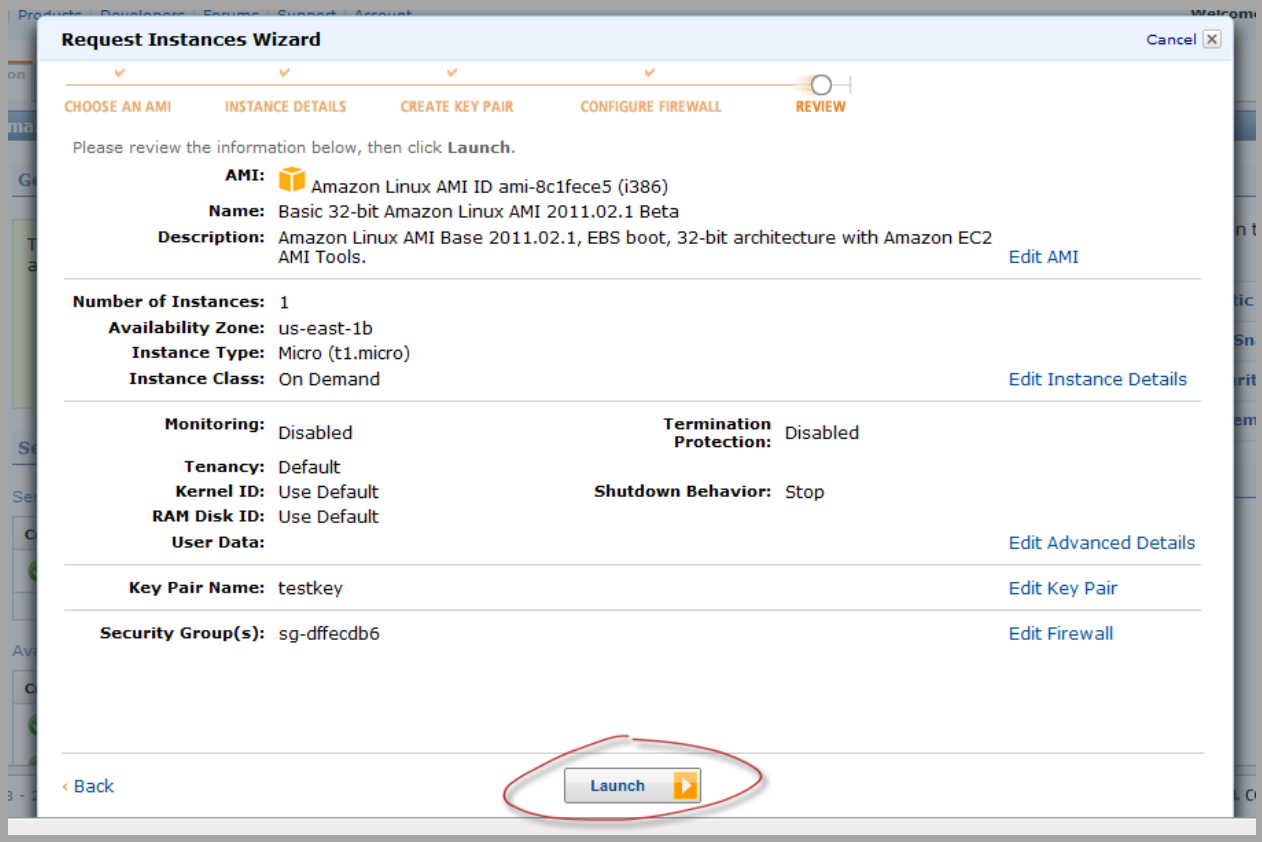


4) *Configure Firewall*

- You can enable/disable ports on your Instance.
- *(Secure Shell) SSH* - used in accessing Amazon Instance by the use of *PuTTY*, *WinSCP*, or other programs that are capable of connecting through the use of SSH protocol.
- *Hypertext Transfer Protocol (HTTP)* – enable this if you want your Instance be available on the internet.
- *MySQL* – enable this if you want to have access to your database



5) Finally, we are almost done. Click “Launch” button when you’re done.



Connecting to Amazon Instance

Connecting to Amazon Instance/Server is easy as 1-2-3. Basically, you connect to your server using FTP Client with access logins like hostname, username and password. In Amazon Instance, you'll need only the hostname and *.ppk file. Below are the steps on how to connect to your Instance. We'll going to use PuTTY and WinSCP.

PuTTY is a client program for the *SSH*, *Telnet* and *Rlogin network* protocols.

These protocols are all used to run a remote session on a computer, over a network. PuTTY implements the client end of that session: the end at which the session is displayed, rather than the end at which it runs.

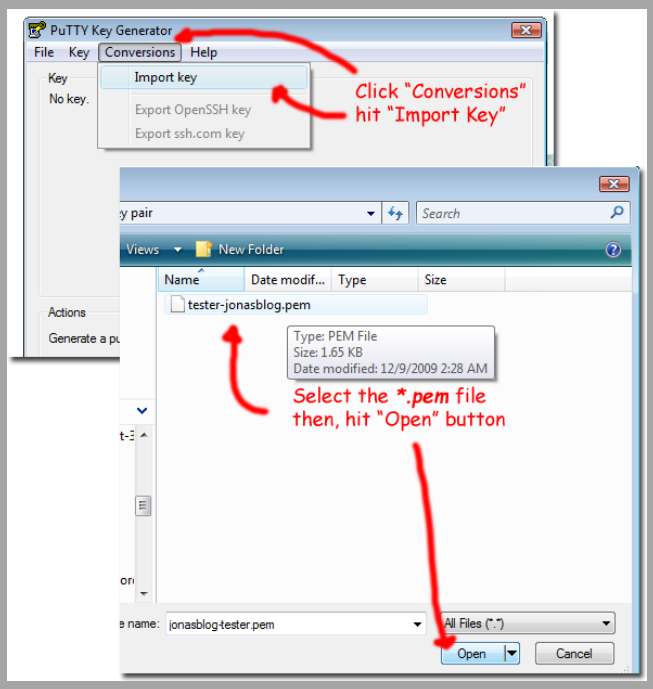
Download page http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

- PuTTY Application →
  http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe
- PuTTY Key Gen →
  http://the.earth.li/~sgtatham/putty/latest/x86/puttygen.exe

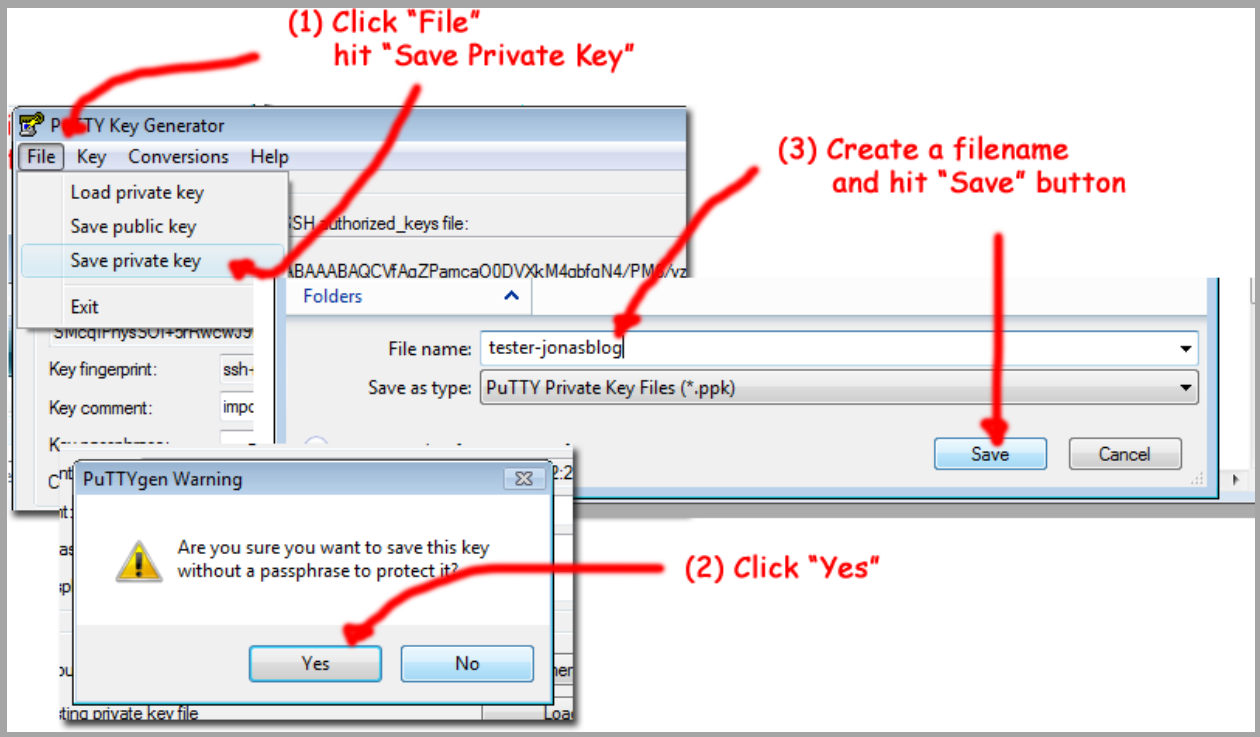
Source: http://clouddb.info/2009/05/26/using-and-managing-aws-part-6-ssh-key-pairs/

First things first – Create PuTTY Private Key (*.ppk*)

1) You should have the copy of Key Pair *(See "**Launching an Instance**" step 3 Creating a Key Pair)* of your Instance. For our copy, we have *tester-jonasblog.pem.*
2) We need to convert this *.pem* file to *.ppk* using PuTTY Key Gen, so that our PuTTY can understand the file. See the ff steps below:
   a. Run PuTTY Key Gen
   b. Click "Conversions" at the Menu bar
   c. Click "Import Key"
   d. Select *.pem* file and then, click "Open" button

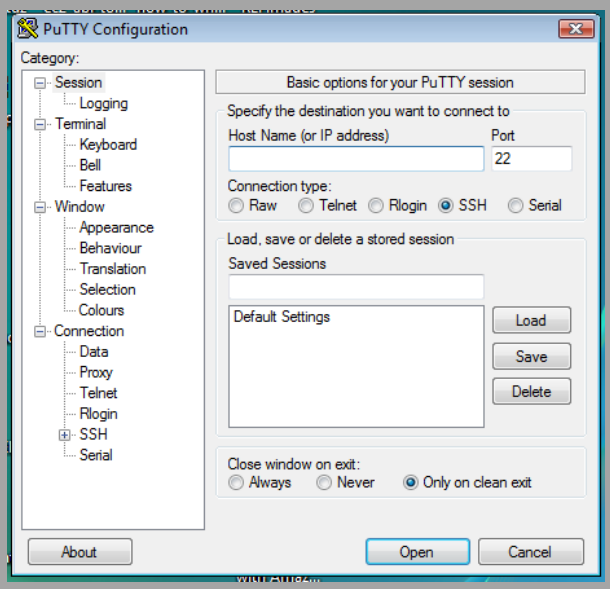


e. Imported Key is now converted, click “File” menu and then hit “Save Private Key” to save the file to *.ppk*
f. Save the key without a passphrase
g. Create a filename and hit “Save” button

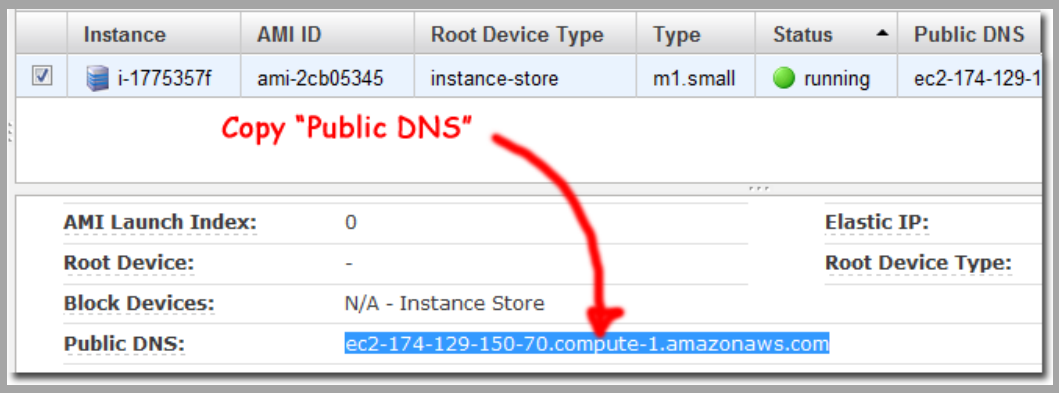


6 Steps to Connect Instance using PuTTY

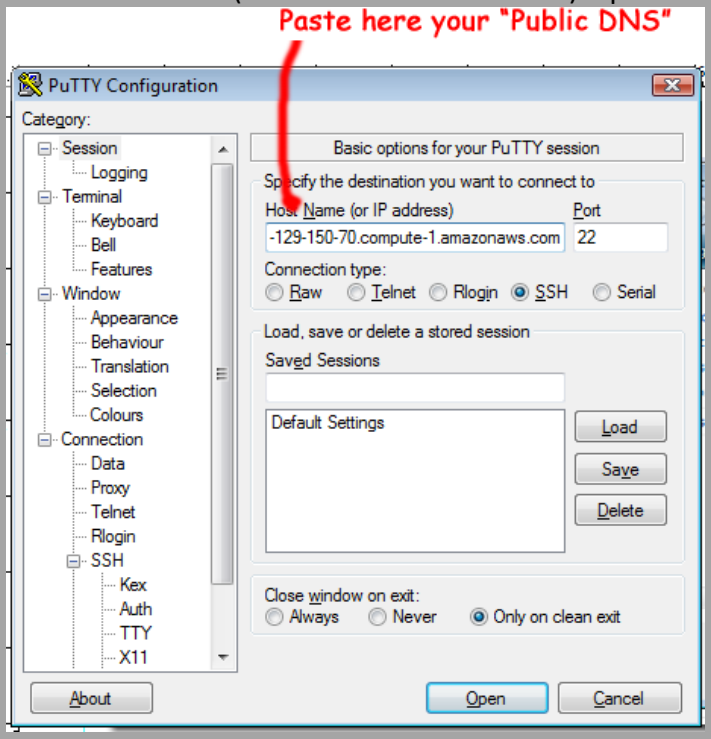
1) Open PuTTY



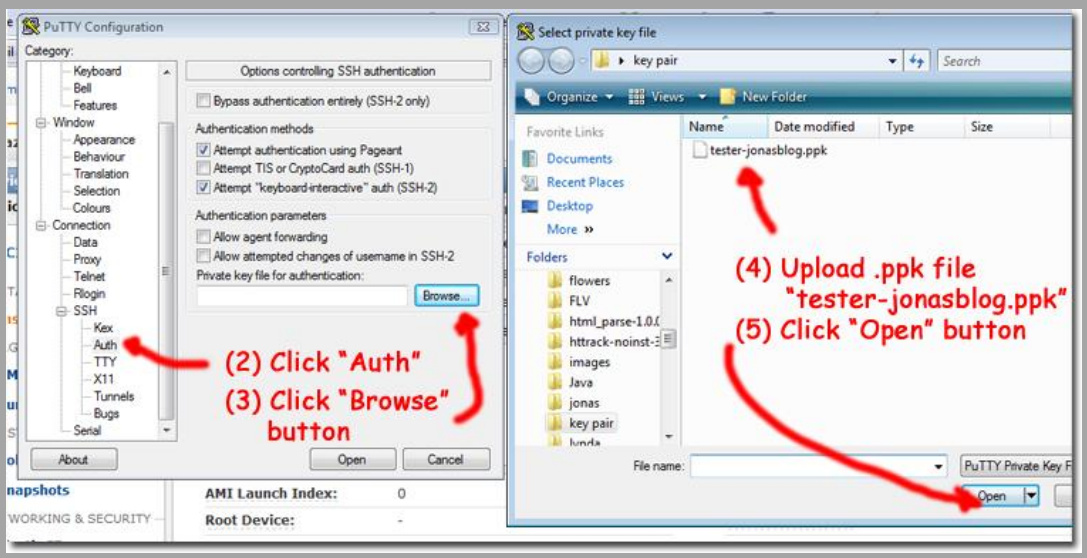
2) Copy Instance Public DNS



3) Insert Public DNS to (Host name or IP Address) input box.



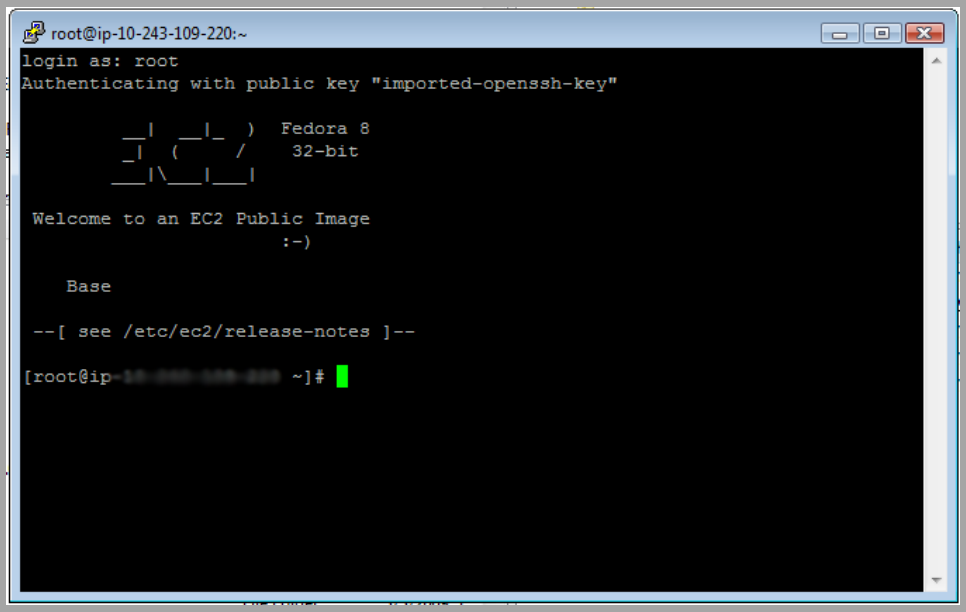
4) Import .*ppk* file on "Auth" page



5) Click "Open" button

6) Login as: **root**

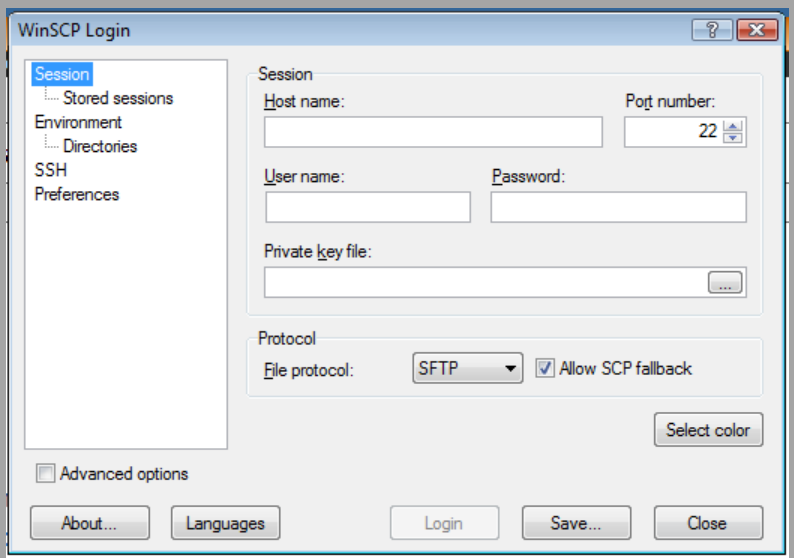
- You have now successfully logged-in to your Instance/Server



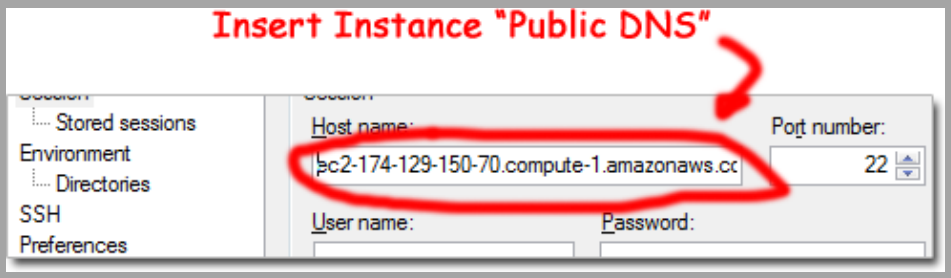
8 Steps to Connect Instance using WinSCP

You can download WinSCP at http://winscp.net/eng/download.php. Click on "*Installation Package*" link, and then install the program.

1) Open WinSCP

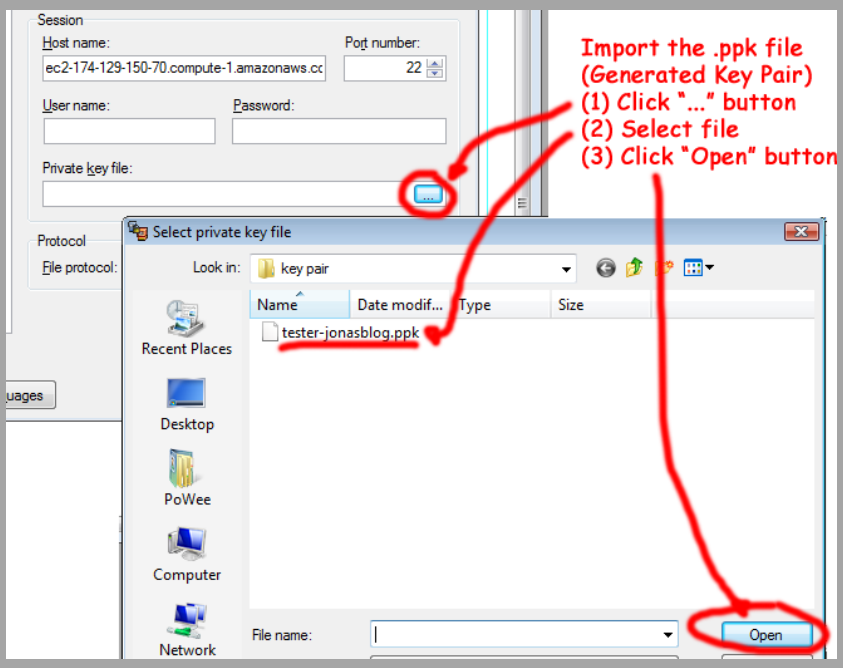


2) Insert "*Public DNS*" on "Host name" input box.

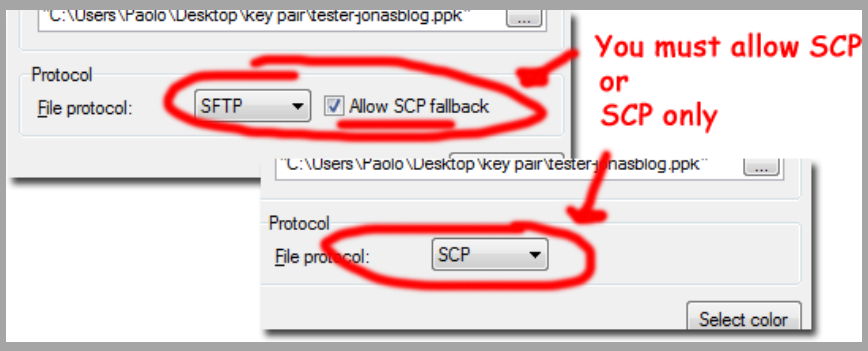


3) Make sure it in port number: 22

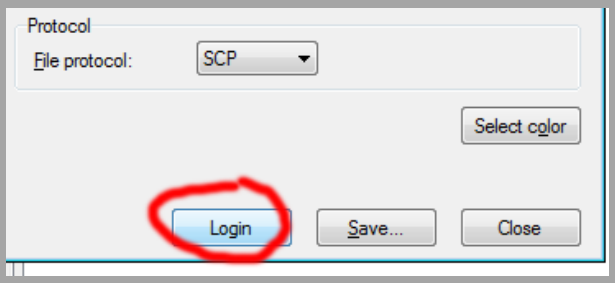
4) Import .ppk file



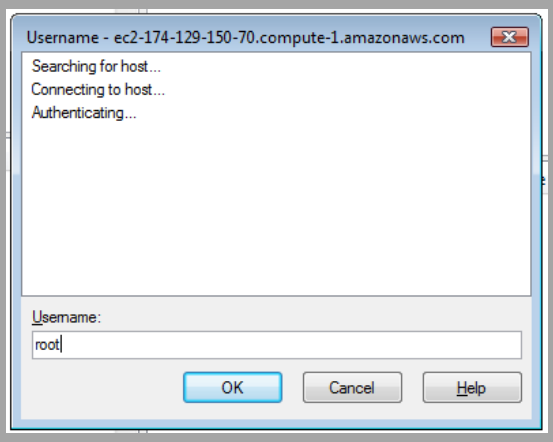
5) File protocol is *SCP*



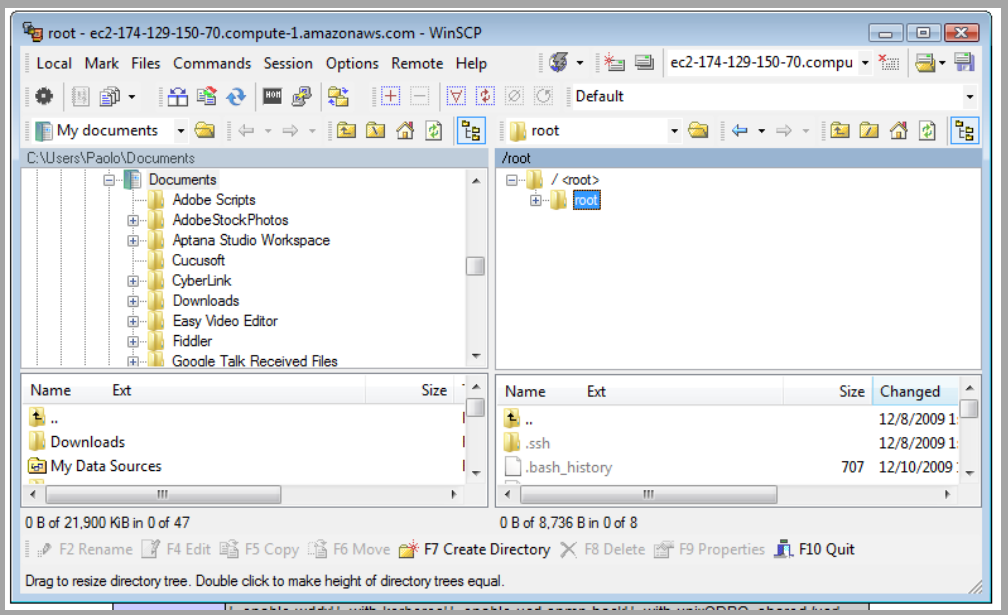
6) Click “Login” button



7) Enter “root” and Click “Ok” button



8) Finally, you are now logged-in to your Instance/Server.



3

Elastic Block Store (EBS)

Amazon Elastic Block Storage (EBS) is a new type of storage designed specifically for Amazon EC2 Instances. Amazon EBS allows you to create volumes that Amazon EC2 Instances can mount as devices much like a standard hard drive. Amazon EBS volumes behave as if they were raw unformatted external hard drives and can be formatted using a file system such as ext3 (Linux) or NTFS (Windows) and mounted on an EC2 instance; files are accessed through the file system .

What is EBS Volume?

Amazon EBS Volumes behaves like a hard drive. You'll mount it on a device on an Instance and your data will be store on that device. You can create Volumes from 1GB to 1TB in size. You can attach and detach EBS Volumes easily. You can detach EBS Volume and let it sit for a while and then attach it with another new instance.

What is EBS Snapshot?

Amazon EBS Snapshots are simply backups or snapshots of your Amazon EBS Volumes and store them in Amazon S3.

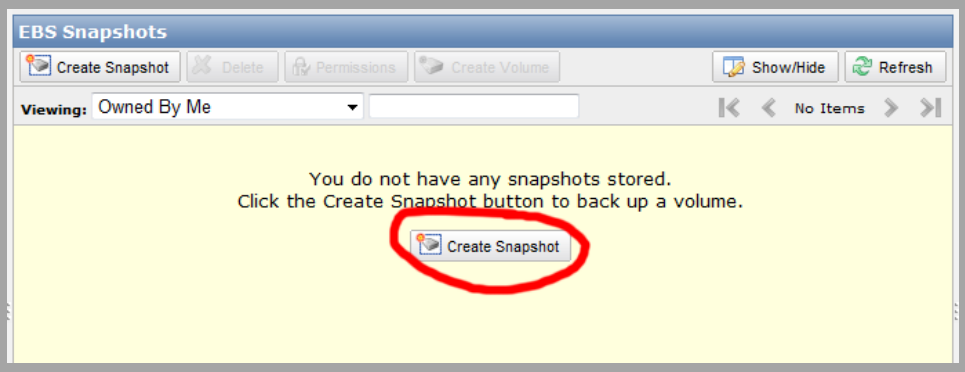
If an EC2 Instance is terminated, the EBS volume will contain the data last written to it. You can create a periodical snapshot of the volume to use as a baseline for new volumes or data backup.

How much it Cost?

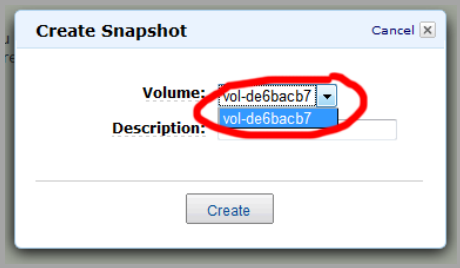
- ✓ EBS storage costs $0.10 per GB per month of allocated disk space. That is 10GB for a month will cost $1.00, and for 100GB a month would be $10.00 per month.
- ✓ I/O request is billed at $0.10 per 1 million I/O requests
- ✓ EC2 Pricing Page: http://aws.amazon.com/ec2/#pricing

Setting up EBS Snapshots

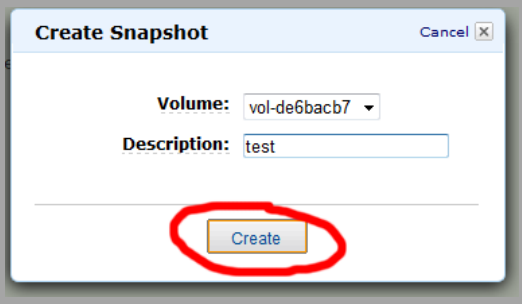
1) Click the button "Create Snapshot"



2) Select a volume you want to create a snapshot



3) Add "Description" and click "Create" Button



4) Done

4

Connecting to Amazon S3

What is an Amazon S3?

Amazon S3 (Simple Storage Service) is storage for the internet. It is designed to make web-scale computing easier for developers.

Amazon S3 allows you to store large amounts of data at a very low cost. Additionally, you'll only pay the storage you have used.

How much does it costs?

Surprisingly, the amount of cost you'll pay is $0.150/GB (*isn't that amazing?*) it's very insignificant.

You can connect to your Amazon S3 Server using an *Amazon S3 Firefox Organizer.* The steps below will show you how easy to use the Amazon S3 Firefox Organizer to upload file, and edit ACL.

Using Amazon S3 Firefox Organizer (firefox plugin)

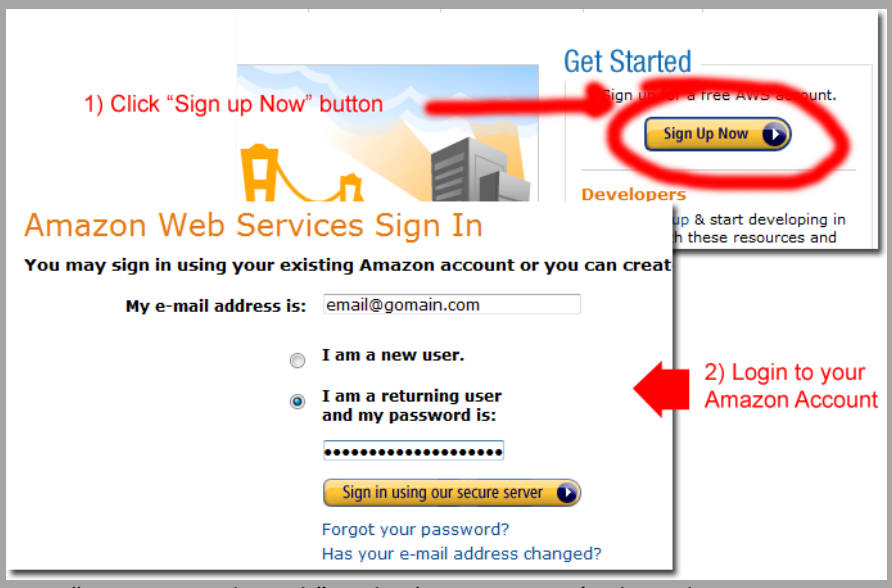
Download Amazon S3 Firefox Organizer plug-in at https://addons.mozilla.org/en-US/firefox/addon/3247 or http://www.s3fox.net/ to their homepage. It's 100% Free developed by Suchi Software Solutions.

7 Steps on uploading a file and Editing its ACL

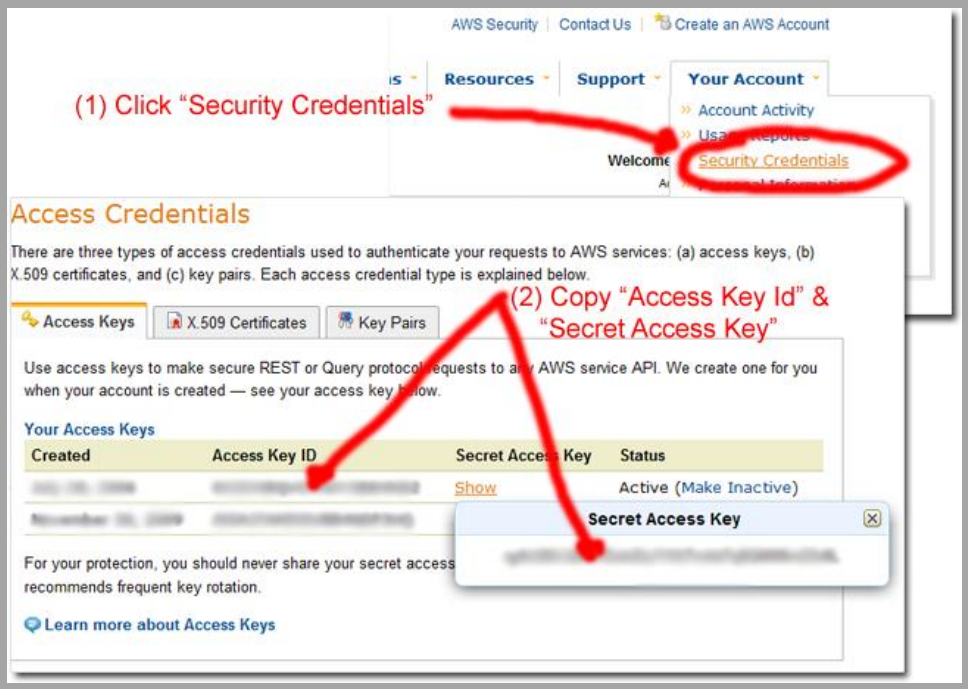
Uploading file made easy with the help of S3 Firefox plug-in. You can use *S3 Firefox Organizer* plug-in to uploading, delete, and edit ACL of certain file in your S3 Server.

1) *Getting Login Access*

- Login to your Amazon Account First → http://aws.amazon.com/console/



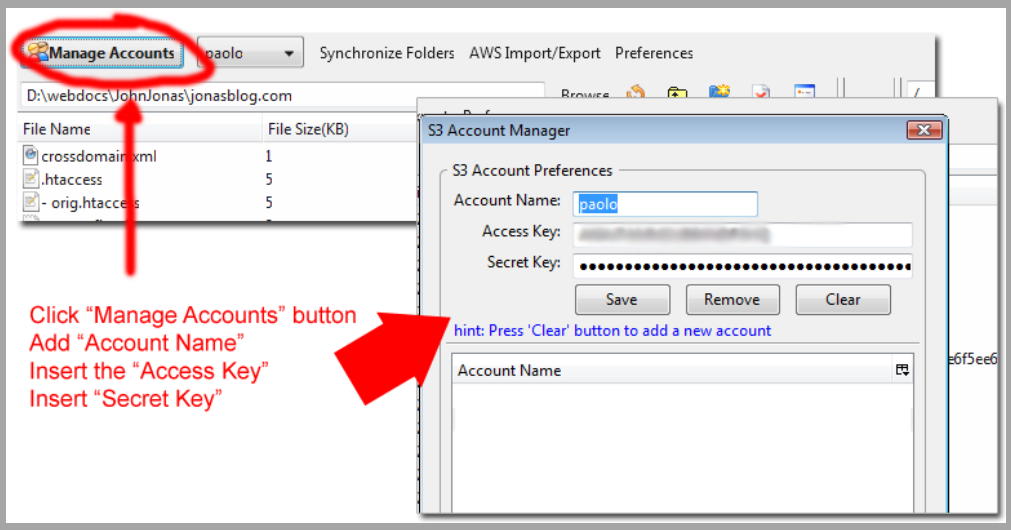
- Go to "*Security Credentials*" under '*Your Account'* Tab, and Copy your *Access Key ID & Secret Access Key*



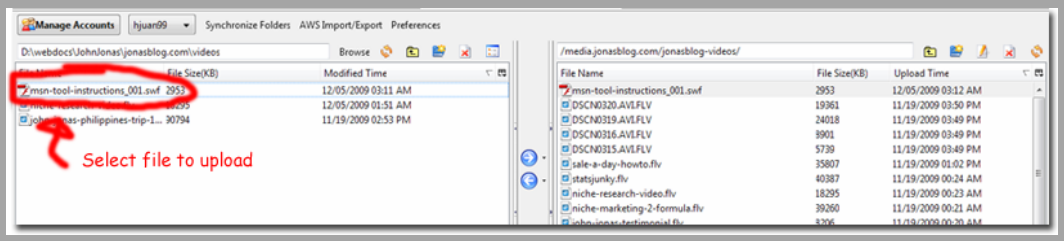
2) *Install Amazon S3 Firefox Organizer Plug-in*

- Download it here https://addons.mozilla.org/en-US/firefox/addon/3247

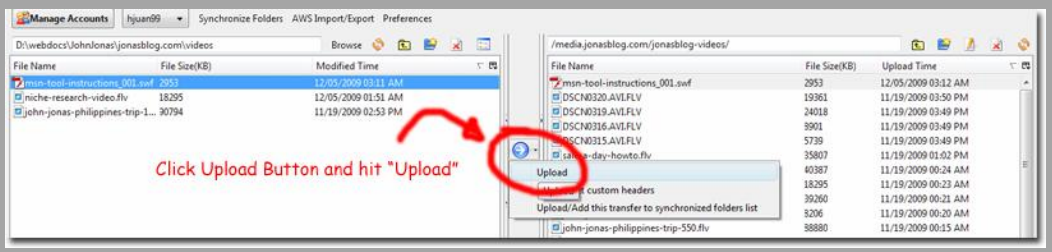
3) *Add Account by click on "Manage Accounts" button*
   - Add any "*Account Name*" like "paolo". You can specify any account name it won't matter.
   - Insert *Access Key ID & Secret keys* from "*Security Credentials"* Page (*refer step 1*).



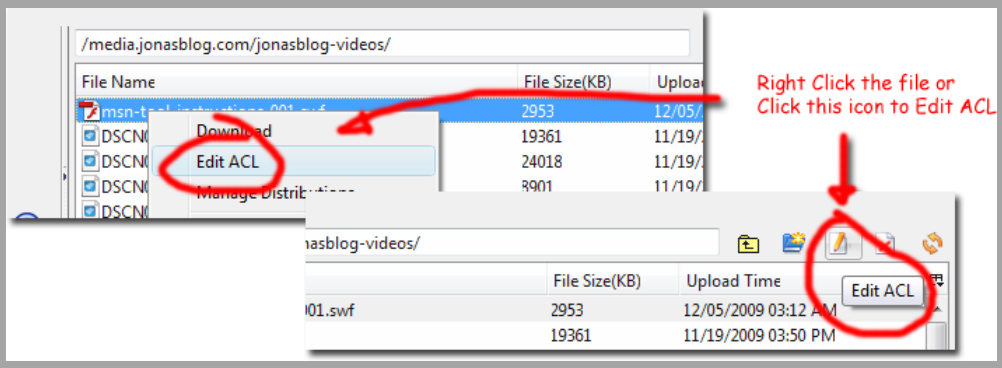
4) *At this moment, you are now connected to the S3 server, then, select a file you wish to upload*



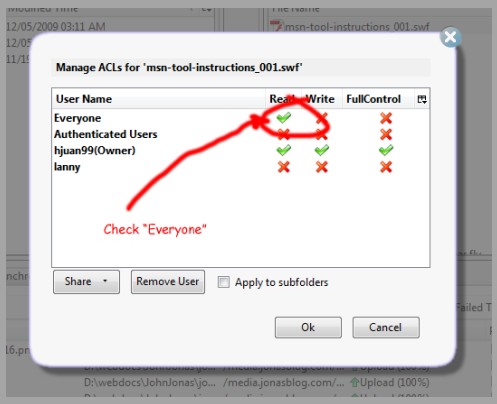
5) *Upload the file*



6) *Edit ACL*



7) *Check "Everyone"- You're giving "everyone" an access to this file.*



You have just successfully uploaded the file to the Amazon S3 Server, and Edited its ACL.

What is an ACL?

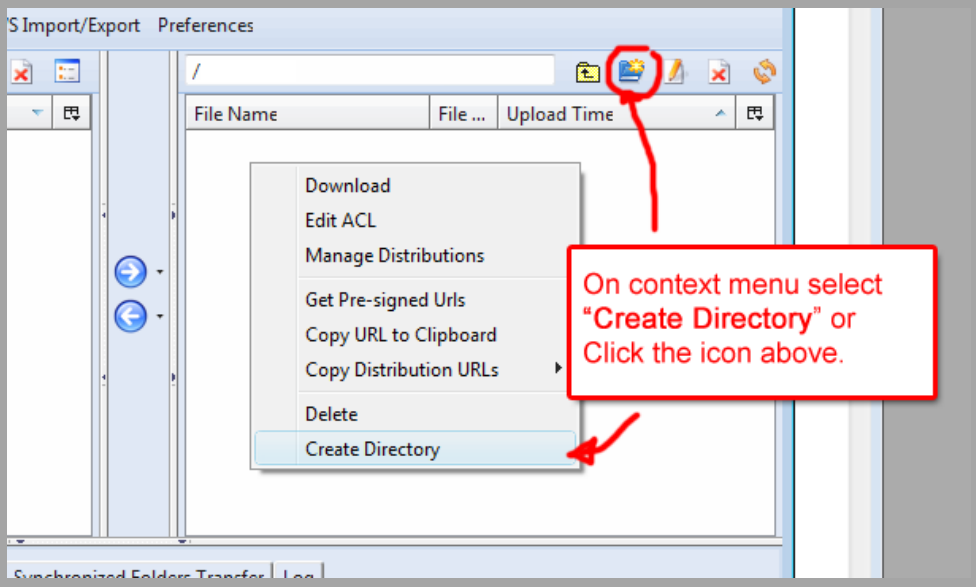
Each Bucket/Folder and Object/File on Amazon S3 has an ACL that defines its Access Control Policy. An ACL is a list of grants. A grant consists of one grantee and permission. ACL is a mechanism which decides who can access the Bucket/Folder or Object/File.

Why do we need to edit the ACL?

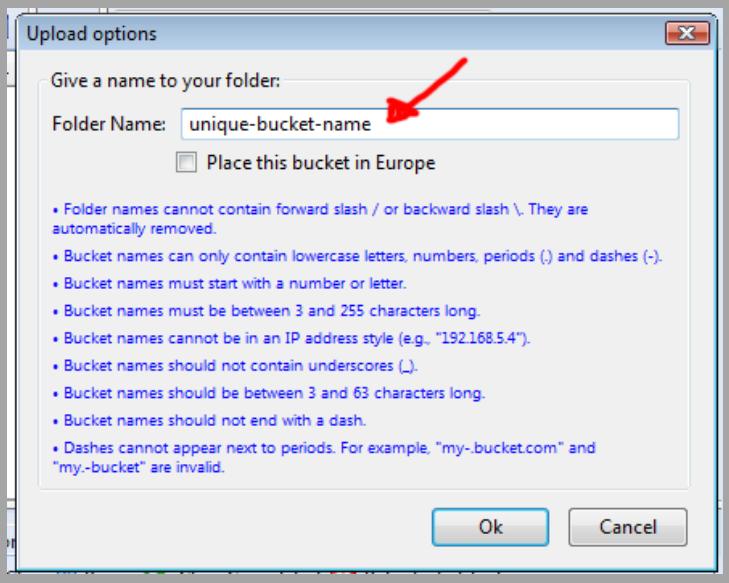
You'll need to edit the ACL so that your visitor can view the file, image, or item. "Check" the icon under the **Read** column for the **Everyone** row. So that the file, image, or item will be visible to everyone, otherwise, it will not be visible or will not appear on the browser.

Creating a Bucket

1) Right Click on the right Panel and select “Create Directory” or Click the icon “Create Bucket/Directory”.



2) Create your bucket name and it should be a unique name.



3) To access the bucket: http://unique-bucket-name.s3.amazonaws.com/ or http://s3.amazonaws.com/unique-bucket-name
   a. http://**[bucket-name]**.s3.amazonaws.com/ or
   b. http://s3.amazonaws.com/**[bucket-name]**

Crossdomain Policy

A cross-domain policy file is an XML document that grants a web client—such as Adobe Flash Player, Adobe Reader, etc.—permission to handle data across multiple domains. When a client hosts content from a particular source domain and that content makes requests directed towards a domain other than its own, the remote domain would need to host a cross-domain policy file that grants access to the source domain, allowing the client to continue with the transaction. Policy files grant read access to data, permit a client to include custom headers in cross-domain requests, and are also used with sockets to grant permissions for socket-based connections.

Setting up a crossdomain.xml

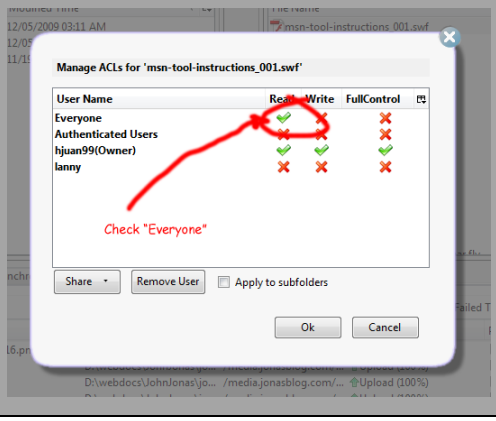
Setting up crossdomain.xml is very useful if you want to play an *.swf or *.flv file, without crossdomain.xml you'll have problem playing you're *.swf or *.flv file. If you encountered this kind of problem just simple follow the steps below.

1) Create a file *crossdomain.xml* and copy the xml source code below:

```
<?xml version="1.0"?>
        <!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">

<cross-domain-policy>
         <allow-access-from domain="*.jonasblog.com" />
</cross-domain-policy>
```

2) Upload it to your root bucket or directory (see below) and make sure you Edit its ACL
   - http://[bucket].s3.amazonaws.com/crossdomain.xml
   - Check “Everyone”



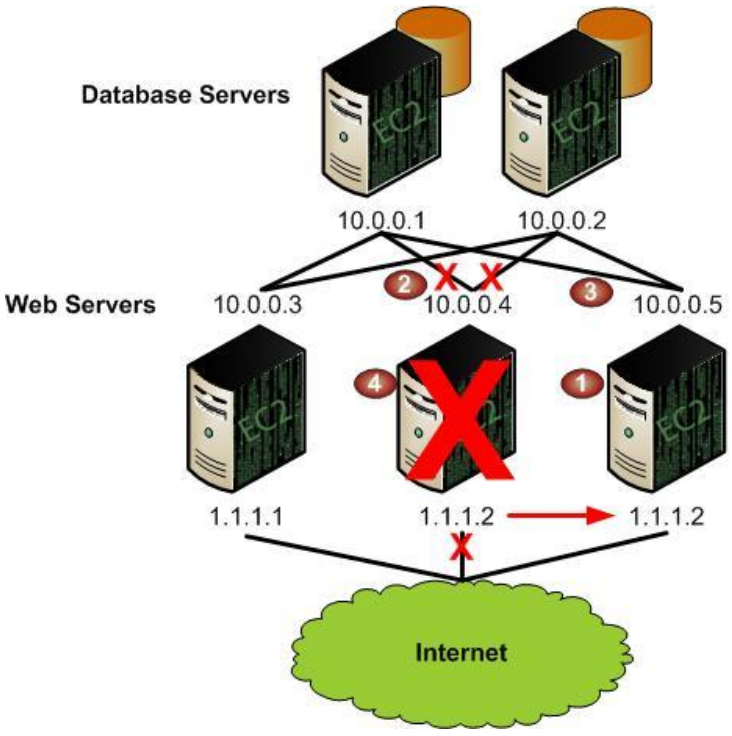
Other Related Topics:
http://developer.amazonwebservices.com/connect/entry.jspa?externalID=2011

5

Elastic IP Address

Elastic IP Address is a static IP address designed for dynamic cloud computing. An Elastic IP Address is associated with your account not a particular Instance, and you have full control on that IP Address. On traditional static IP Address, you'll wait on for the technician to reconfigure or replace your host, or waiting for DNS to propagate to all of your customers, Amazon EC2 enables you to engineer around problems with your Instance or Software by quickly remapping your Elastic IP Address to a replacement Instance.

In the following image, web servers are connected to the Internet through elastic IP addresses and to database servers through their private IP addresses.

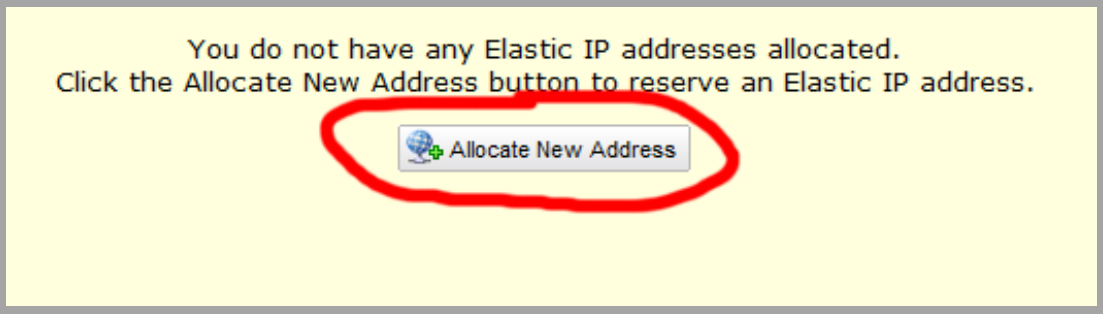


The administrator decides to replace a web server with a larger instance type. To do this, the administrator starts a new instance using a larger instance type (1), disassociates an elastic IP address from a running instance (2), associates the elastic IP address with the new instance (3), and terminates the old instance (4).

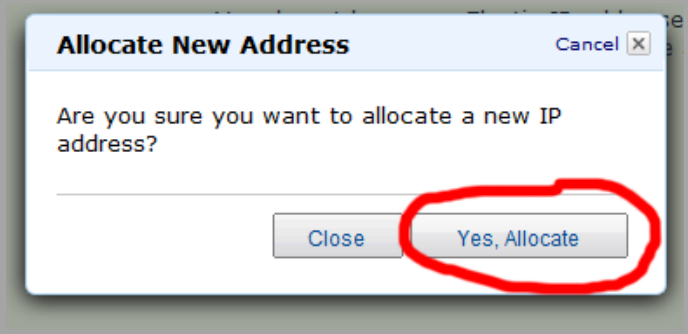
Amazon Elastic IP Address is free while they are assigned to an Instance, but they cost $0.01/hr if they are not assigned.

Allocating an Elastic IP Address

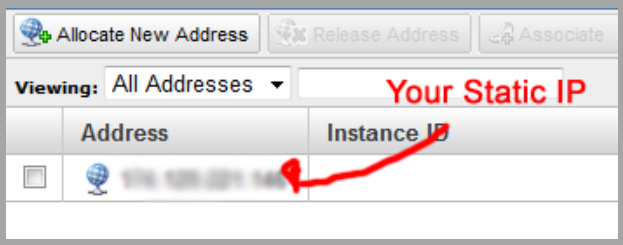
1) *Go to "Elastic IPs"*



2) *Click the button "Yes, Allocate"*



3) *Done.* You'll notice your IP Address will appear on Address column.



6

Installing Apache with PHP and MySQL (LAMP)

LAMP is short for **L**inux, **A**pache, **M**ySQL, & **P**HP. I show you how to install Apache, MySQL, and PHP on your Linux server using putty. I assume you successfully log-in on your server using putty.

1) Check if httpd, php, or mysql is installed.

   $ rpm -q httpd

   $ rpm -q php

   $ rpm -q mysql

2) Install Apache

   $ yum install httpd

   Starting, Stopping, and Restarting Apache

   $ /etc/init.d/httpd [start|stop|restart]

   or

   $ service httpd [start|stop|restart]

3) Install PHP

   $ yum install php

4) Install MySQL

   $ yum install mysql mysql-server

5) Install PHP Modules

   $ yum install php-mysql php-gd php-imap php-ldap php-odbc php-pear php-xml php-xmlrpc php-eaccelerator php-magickwand php-magpierss php-mbstring php-mcrypt php-mssql php-shout php-snmp php-soap php-tidy

6) Restart Apache

   $ /etc/init.d/httpd restart

7) Done.

7

MySQL Database

A website that uses MySQL may include Web pages that access information from a database. These pages are often referred to as "dynamic" pages, meaning the content of each page is generated from database. Website that uses dynamic web pages is also known as database-driven websites.

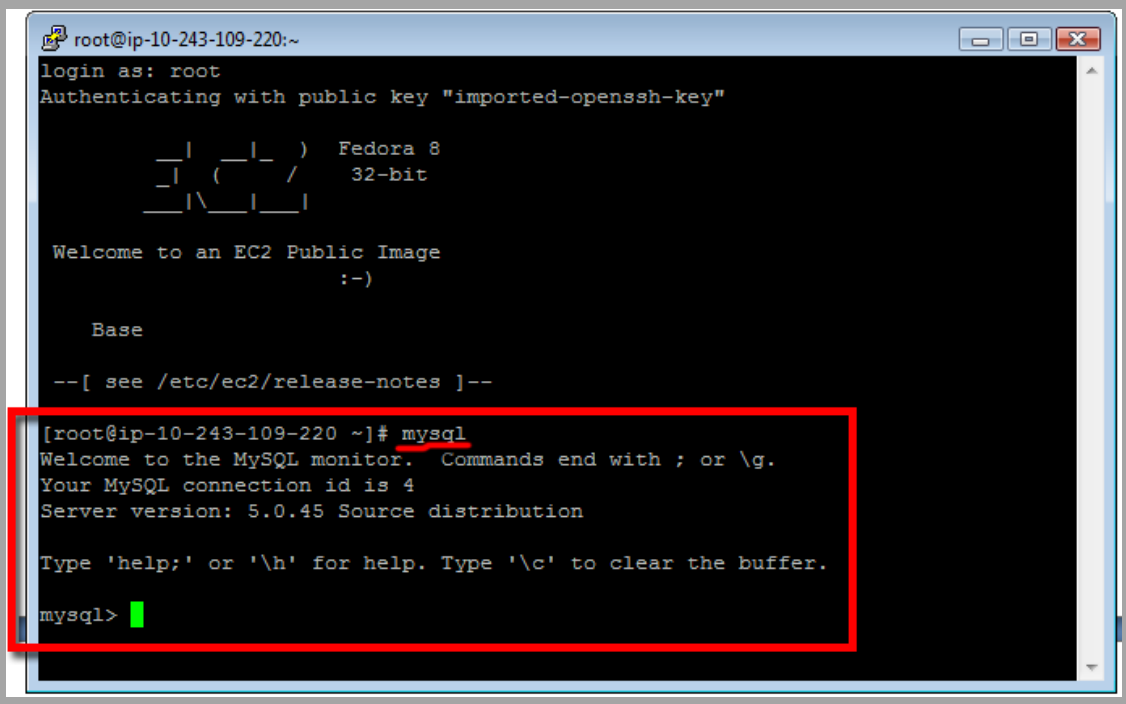
What is a MySQL?

MySQL is an open source Relational Database Management System (RDBMS) that relies on SQL for processing the data in the database. MySQL can be used for a variety of applications, but is most commonly used for web applications and for embedded applications and has become a popular alternative to proprietary database systems because of its speed and reliability.

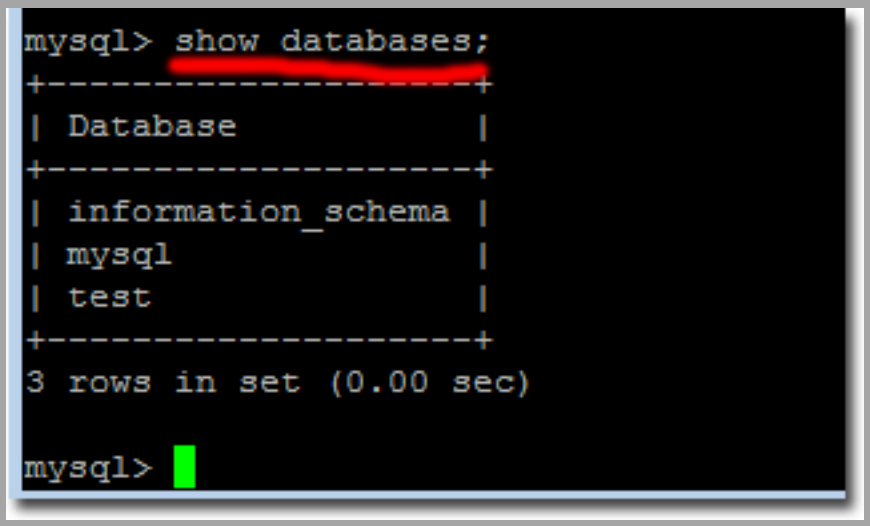
Connecting MySQL Server using PuTTY
Login to your Instance using PuTTY if you forgot how to connect please refer to **Part 2 Amazon Instance: 6 Steps to Connect Instance using PuTTY**

If you're logged in, please follow the steps below:

1) Type "**mysql**", and it will prompt you to mysql environment. *mysql>*
   At this moment you're now connected to mysql server.

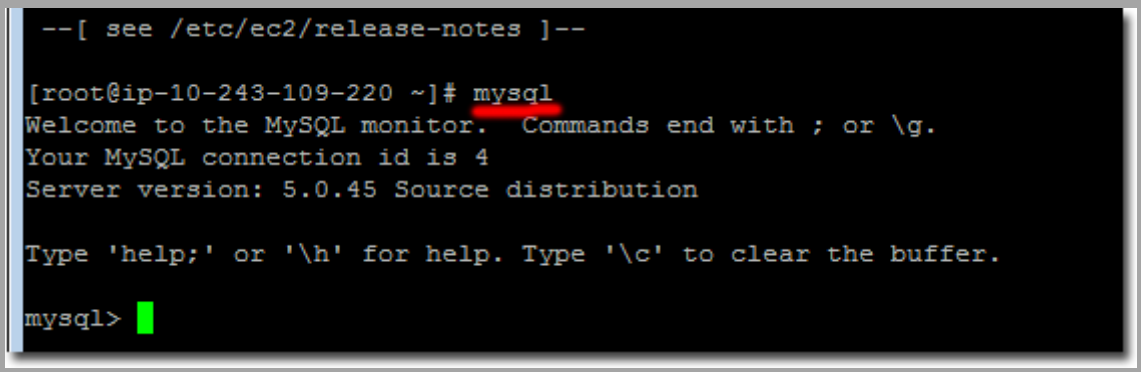


2) To show the list of existing databases. Type "**show databases".** The databases *information_schema*, *mysql*, and *test* these are default databases.

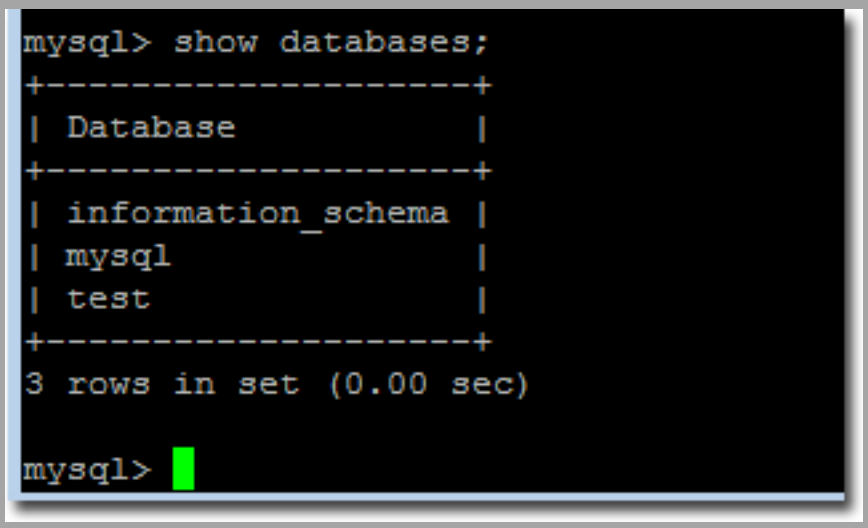


Creating a Database using PuTTY

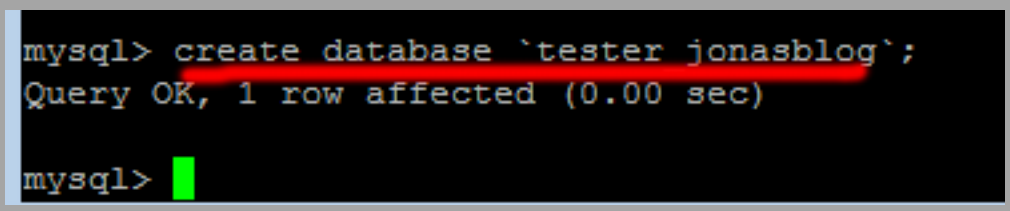
1) Log-in to your instance using PuTTY, and type "**mysql"**



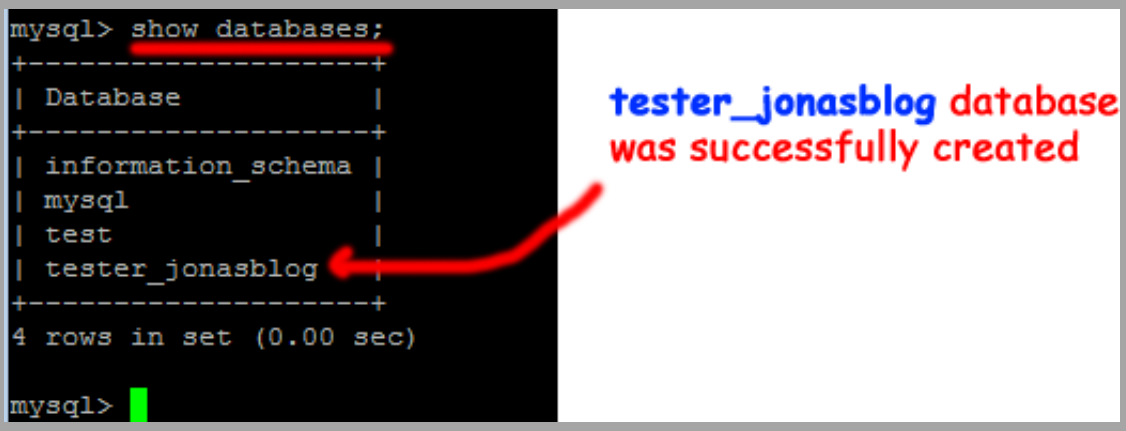
2) Type "**show databases".** To list all existing databases.



3) Type "**create database** `*database_name*`**;"**



4) Type "**show databases;"** again. You'll notice the database you've just created will appear on the list.



5) To select a database. Type "**use** *database_name;"*

We have now successfully created a database.

What is a phpMyAdmin?

phpMyAdmin is an open source tool written in PHP intended to handle the administration of MySQL over the World Wide Web. It can perform various tasks such as creating, modifying or deleting databases, tables, fields or rows; executing SQL statements; or managing users and permissions.

Installing phpMyAdmin
I assume that you're logged in to your Instance using PuTTY

1) Get a copy of phpmyadmin using wget:
   Wget
   http://sourceforge.net/projects/phpmyadmin/files/phpMyAdmin/3.2.5/phpMyAdmin-3.2.5-english.tar.bz2/download

```
[root@ip-10-243-109-220 ~]# wget http://sourceforge.net/projects/phpmyadmin/file
s/phpMyAdmin/3.2.5/phpMyAdmin-3.2.5-english.tar.bz2/download
```

2) Untar phpMyAdmin file:
tar xvfj phpMyAdmin-3.2.5-english.tar.bz2

```
jonasblog-2010-02-23_db.sql
[root@ip-10-243-109-220 ~]# tar xvfj phpMyAdmin-3.2.5-english.tag.bz2
```

3) Move the extracted phpMyAdmin to your root directory:
mv phpmyadmin /home/webuser/helloworld/htdocs/phpmyadmin

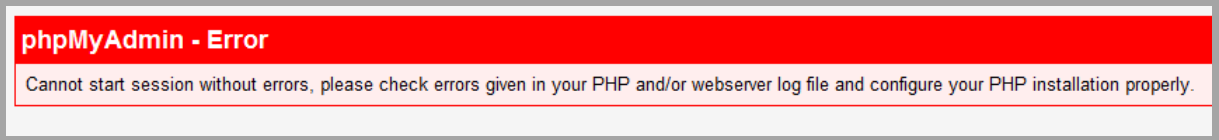
```
[root@ip-10-243-109-220 html]# mv phpmyadmin /home/webuser/helloworld/htdocs/php
myadmin
```

4) Change the directory or Go to phpmyadmin directory
cd /home/webuser/helloworld/htdocs/phpmyadmin

```
[root@ip-10-243-109-220 html]# cd /home/webuser/helloworld/htdocs/phpmyadmin
```

5) Open your browser and Go to web site:
*http://**[your-website-address]**/phpmyadmin*

6) If you encounter this error on your browser. Please proceed to step 7. If not, you have just successfully created a phpMyAdmin.



7) You have to change the chmod of your session folder:
chmod 777 /var/lib/php/session/

8

Wordpress

What is a Wordpress?

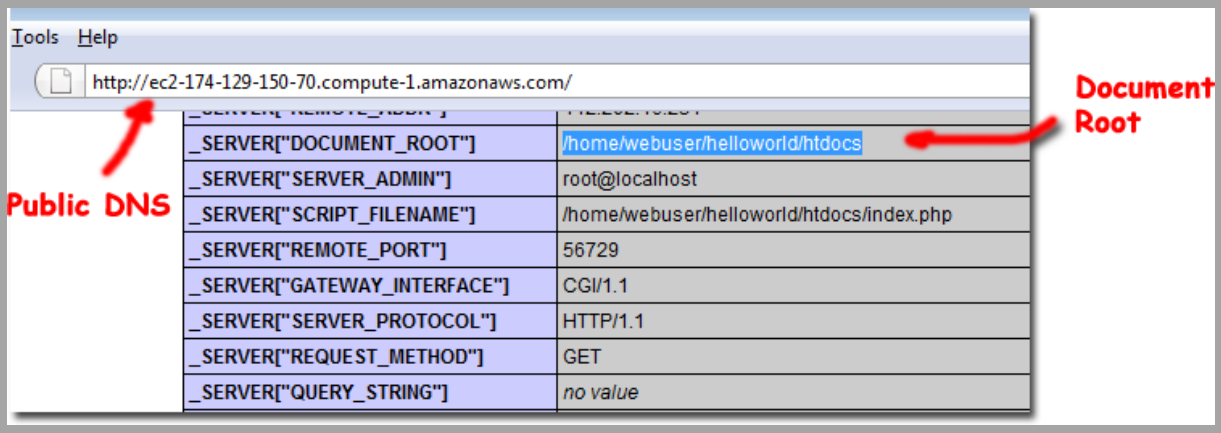
WordPress is an open-source CMS designed for blogging, but easily modified to enable the management of an entire website. It is the most popular blogging tool in the internet today.

Advantages of using Wordpress

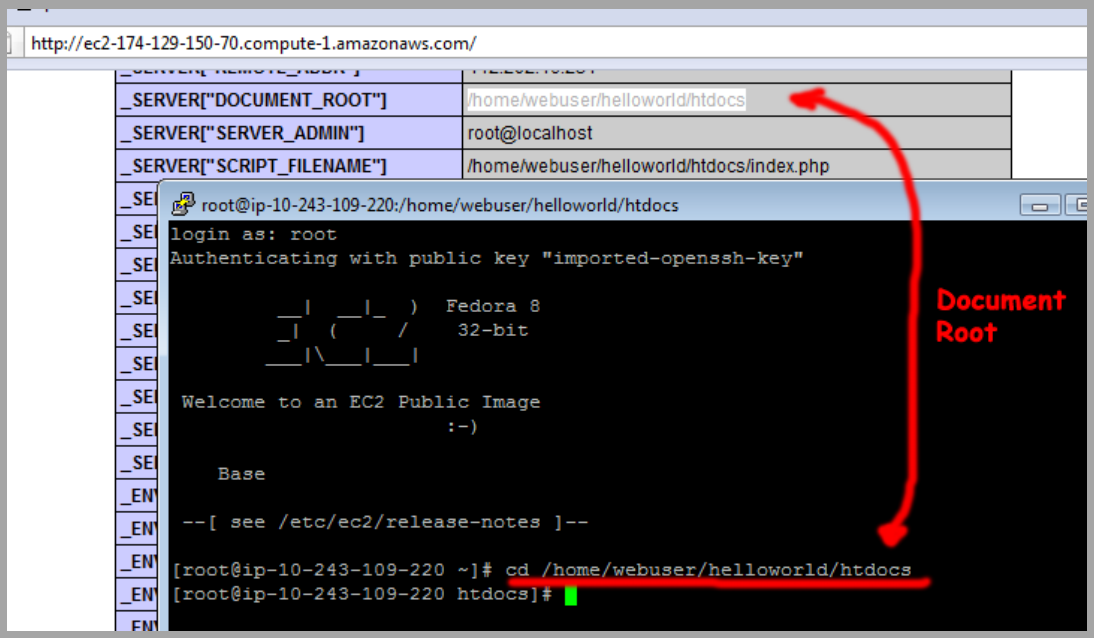
- Ability to categorize your posts by topic, not just by date
- Ability to choose from hundreds of themes/skins
- Ability to integrate plugins
- Large user community with help forums
- Extensive documentation
- Ability to completely customize Wordpress code
- Ease of installation
- No ads
- Abililty to distribute podcasts with audio player plugins
- and a lot more..

Installing a Wordpress

1) Get document_root path or htdocs

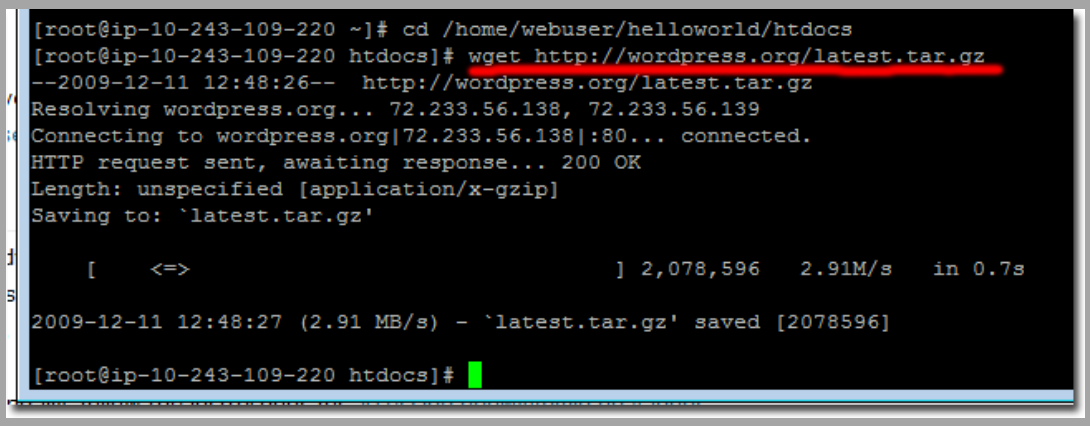


2) Open PuTTY and then navigate to document_root



3) Download the lastest Wordpress copy

   - *wget http://wordpress.org/latest.tar.gz*



4) Then unzip the package using:

   - *tar -zxvf latest.tar.gz*

Congratulation, you have now successfully unzip Wordpress software package unto your server.

Configuring Wordpress

1) Go to wordpress directory
   - *cd /home/webuser/helloworld/htdocs/wordpress*
2) Copy-Paste and Rename "**wp-config-sample.php**"
   - *cat wp-config-sample.php >wp-config.php*
3) Modify "**wp-config.php**" with the appropriate database config
4) Continue configuring Wordpress on your website at
   - *http://**[your-website-address]**/wordpress/*

9

Domain Name

A domain name is the text name corresponding to the numeric IP address of a computer on the Internet. A domain name must be unique. Internet users access your website using your domain name. For instance Jonasblog.com, ReplaceMySelf.com and OnlineJobs.ph are all domain names.

What is a DNS?

DNS stands for **D**omain **N**ame **S**ystem. A DNS server lets you locate computers on a network or the Internet (TCP/IP network) by domain name. The DNS server maintains a database of domain names (host names) and their corresponding IP addresses. Jonasblog IP address, 174.129.221.146, corresponds to the DNS name www.jonasblog.com

What is a CNAME?

CNAME is short for **C**anonical **Name.** You should use a CNAME record whenever you want associate a new subdomain to an already existing A record; i.e. you can make "www.somedomain.tld" to "somedomain.tld", which should already have been assigned an IP with an A record.

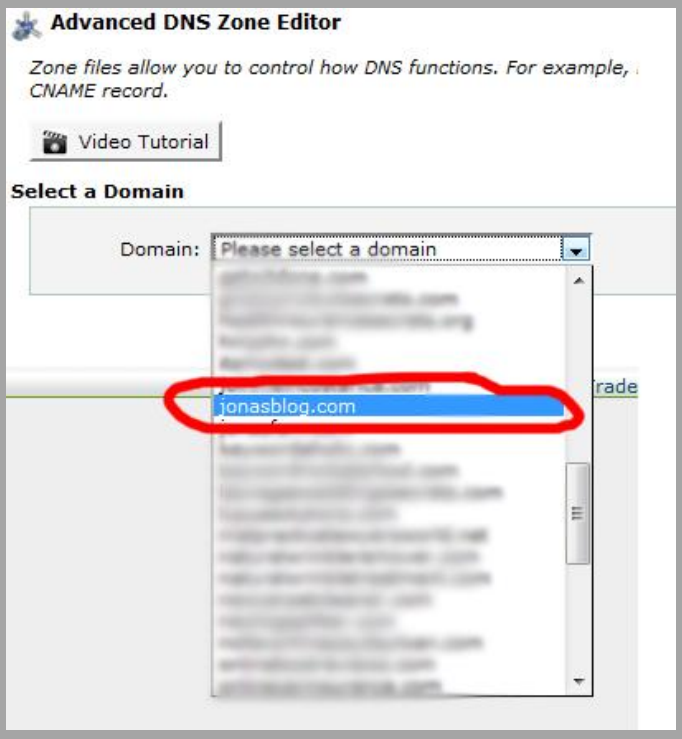
This allows you to have as many subdomains as you wish without having to specify the IP for every record. Use a CNAME if you have more services pointing to the same IP. This way you will have to update only one record in the convenience of a change of IP address.

How to point your subdomain to Amazon S3 Server?

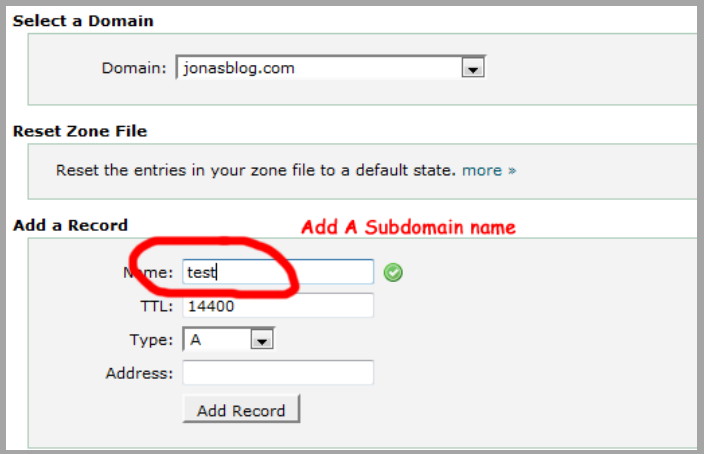
Setting up a CNAME in hostmonster CPanel

1) Go to **"Advanced DNS Zone Editor"**

   Select the domain name you want to add a CNAME record. i.e. jonasblog.com



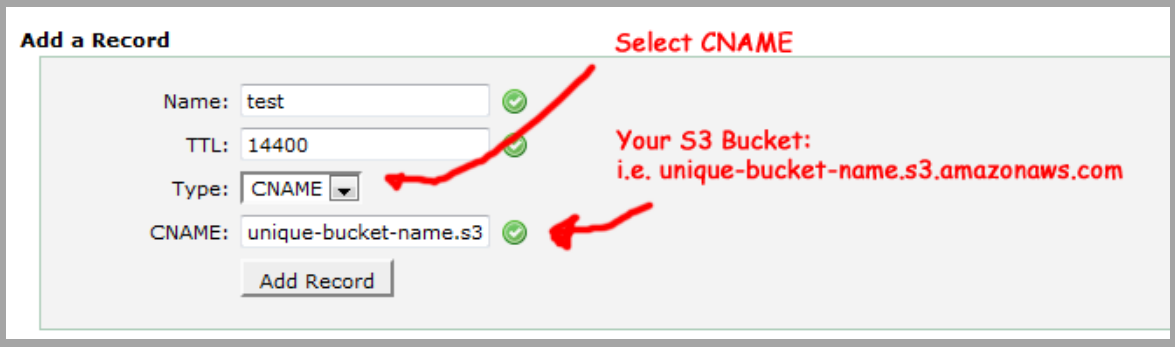
2) Add a subdomain **Name** on "**Add a Record**" Section. i.e. *test*



3) Select **"CNAME"** and add the S3 bucket name

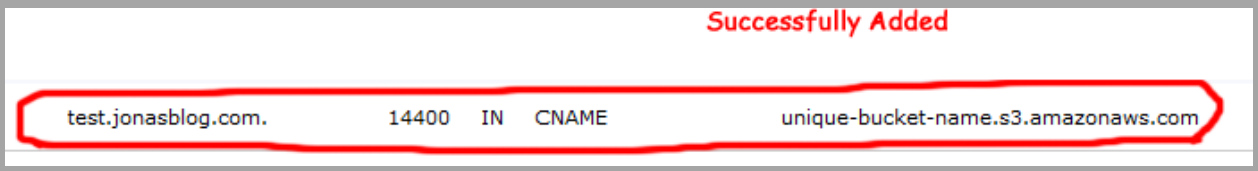
   - [yourbucketname].s3.amazonaws.com

     i.e. *unique-bucket-name.s3.amazonaws.com*



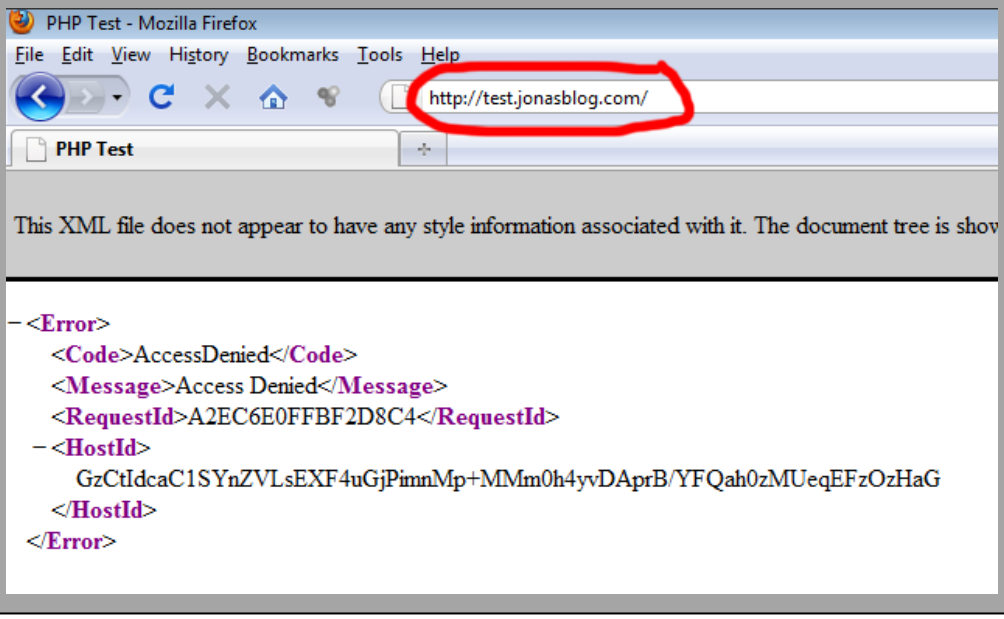
4) Click "**Add Record**" button

5) After you have submitted the form. You'll notice the



6) Visit your subdomain:

   - i.e. *http://test.jonasblog.com/*



Thank you.