INTRODUCTION TO AWS

Websites & Web Apps on AWS

Work with foundational services for marketing websites on AWS

Websites & Web Apps on AWS

AWS offers services that provide businesses with a flexible, highly scalable, and low-cost way to deliver their websites and web applications

Monster Chan

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1.1 What is Amazon EC2?

Amazon Elastic Computer (Amazon EC2) is web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computer easier for developers.

Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. It provides you with complete control of your computing resourcesand lets you run on Amazon's proven computing environment. Amazon EC2 reduces the time required to botain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change. Amazon EC2 changes the economics of computing by allowing you to pay only for capacity on its needs.

Amazon EC2 enable you to increase or decrease capacity within minutes, not hours or days. You can commission one, hundreds or even thousands of server instances simultaneously. Of course, because this is all controlled with web service APIs., your application can automatically scale itself up and down depending on its needs.

You have the choice of multiple instance types, operating system, and software packages. Amazon EC2 allows you to select a configuration of memory, CPU, instance storage, and the boot partition size that is optimal for your choice of operating system and application. For example, your choice of operation system includes numerous Linux distributions, and Microsoft Windows Server.

Amazon EC2 works in conjunction with Amazon Simple Storage Service (Amazon S3). Amazon Relational Database Service (Amazon RDS). Amazon SimpleDB and Amazon Queue Service (Amazon SQS) to provide a complete solution for computing, query processing and storage across a wide range of applications.

Amazon EC2 offers a highly reliable environment where replacement instance can be rapidly and predictably commissioned. The service runs within Amazon's network infrastructure and datacenters. The Amazon EC2 Service Level Agreement commitment is 99.95% availability for search Amazon EC2 region.

Amazon EC2 works in conjuction with Amazon Virtual Cloud (VPC) to provide security and robust networking functionaility for compute resources.

Amazon EC2 passes on to you the financial benefits of AMazon's scale. You pay a very low rate for the compute capacity you actually consume.

However, it can only give a brief overview of Amazon EC2 cincepts. For further information, see the official Amazon Web Services Documentation for https://aws.amazon.com/cn/documentation/ec2/[1].

1.2 Verify Your Region in the AWS management Console

With Amaozn EC2 you can place instances in multiple locations. Amazon EC2 locations are composed of regions that contain *Avaliability Zones*. Regions are dispersed and located in separate geographic area (US, EU, etc). Availability Zones are distinct locations within a region that are engineered to be isolated from failures in other Availability Zones and to provide indespensive, low-latency network connectivity to other Availability Zones in the same region.

By launching instances in separate regions, you can design your application to be closer to specific customers or to meet legal or requirements. By launching instances in separate Availity Zones, you can protect your application from localized regional failures.

1.2.1 Verify your region

Tip The AWS region name is always listed in the upper-right corner of the AWS Management Console, in the navigation bar.

- Make a note of the AWS *region name*, for example, *US West(Oregon)*, that your lab is configured for.
- Use the chart below to detemine the *region code*. You will normally use the code (us-west-2) instead of the region name (US West (Orgon)) whenever your lab asks you to specify your region.

Region Name	Region	Endpoint	Protocol
US East (N. Virginia)	us-east-1	ec2.us-east-1.amazonaws.com	HTTP and HTTPS
US West (Oregon)	us-west-2	ec2.us-west-2.amazonaws.com	HTTP and HTTPS
US West (N. California)	us-west-1	ec2.us-west-1.amazonaws.com	HTTP and HTTPS
EU (Ireland)	eu-west-1	ec2.eu-west-1.amazonaws.com	HTTP and HTTPS
EU (Frankfurt)	eu-central-1	ec2.eu-central-1.amazonaws.com	HTTP and HTTPS
Asia Pacific (Singapore)	ap-southeast-1	ec2.ap-southeast-1.amazonaws.com	HTTP and HTTPS
Asia Pacific (Sydney)	ap-southeast-2	ec2.ap-southeast-2.amazonaws.com	HTTP and HTTPS
Asia Pacific (Tokyo)	ap-northeast-1	ec2.ap-northeast-1.amazonaws.com	HTTP and HTTPS
South America (Sao Paulo)	sa-east-1	ec2.sa-east-1.amazonaws.com	HTTP and HTTPS

For more information about regions, see http://docs.aws.amazon.com/general/latest/gr/rande.html[2]

[1] https://aws.amazon.com/cn/documentation/ec2/

[2] http://docs.aws.amazon.com/general/latest/gr/rande.html

1.3 Creating a New Amazon EC2 Server Instance

In this module, you will create a new Amazon EC2 server that will host a web server visible to anyone over the Internet. In this pared-down example, the web server will host a simple PHP script that provides some basic information about the server on which it is running.

1.3.1 Application Machine Images (AMIs) and instances

Amazon EC2 provides tmeplates know as *Amazon Machine Images (AMIs)* that contain a software configuration (for example, an operating system, an application server, and applications). You use these templates to launch an *instance*, which is a copy of the AMI running as a virtual server in the cloud.

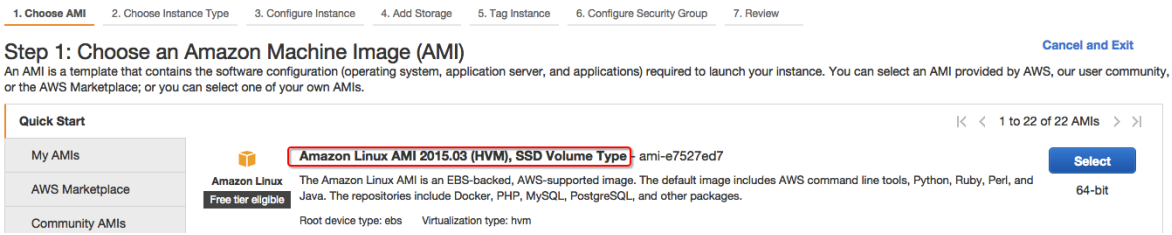
You can launch different types of instances from a single AMI. An *instance type* essentially determines the hardware capabilities of the virtual host coputer for your instance. Each instance type offers different computer and memory capabilites. Select an instance type based on the amount of memory and computeing power that you need for the application or software that you plan to run on the instance. You can launch multiple instance from an AMI.

You instance keeps running until you stop or terminate ir or until it fails. If an instance fails, you can launch a new one from the AMI.

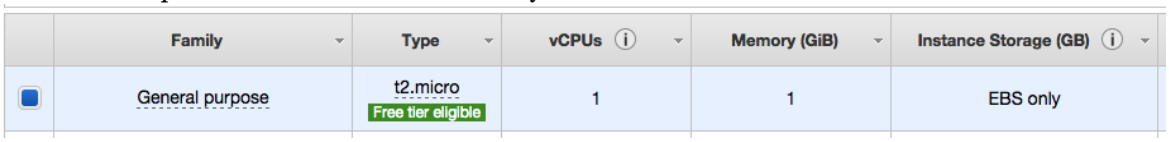
1.3.2 Lanuch a Linux instance

In this session, you will launch a default Amazon Linux instance with an Apache PHP web server installed on initialization.

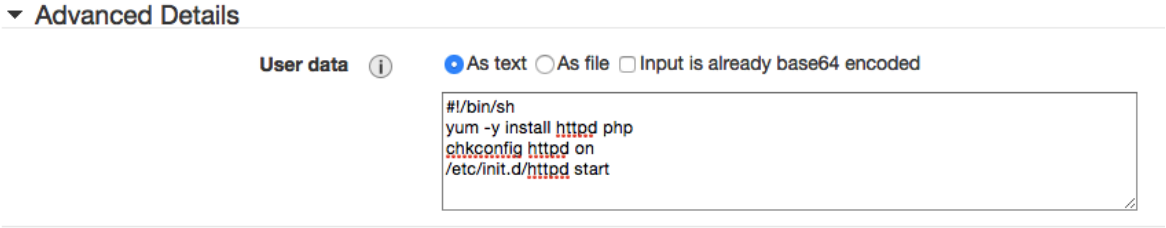
- On the **Services** menu, click **EC2**.
- Click **Launch Instance**.
- Because you require a linux instance, in the row for the basic 64-bit **Amazon Linux AMI**, which will normally be the first operation on the list, click **Select**.
  When you create an instance, AWS will ask you which instance *family* want to use. The family you choose determines how much throughput and processing cycles are available to your instance.



- On the **Choose an Instance Type** page, the Micro instance type, which is the smallest and lowest-cost option, should be automatically selected.



- Cilck **Next**: **Configure Instance Details**.
- On the **Configure Instance Details** page, scroll down and expand the **Advanced Detail** section.
- For **User date**, select **As text**.



  Since you will be using your Amazon EC2 instance as a web server, you need to ensure that the Apache HTTPd sever is up and running, and that the PHP programming language is installed. We can accomplish this with a imple Linux shell script. The script belo installs HTTPd and PHP using the yum package manager, and then starts the HTTPd server.
- Copy the following initialization script to a text file, and then copy it from the text file to the **User data** box, This will automatically install and start the Apache Web server when the instance is created and launches:

```
#!/bin/sh
yum -y install httpd php
chkconfig httpd on
/etc/init.d/httpd start
```

- Click **Next**: **Add Storage**.
  This page displays which *Amazon Elastic Block Store (EBS)* volumes are attached to your image. When you launch an Amazon EC2 instance, the root device volume contains the image used to boot the instance. Instances that use Amazon EBS for the root device automatically have an Amazon EBS volume attached. When an AMazon EBS-backed instance is launched, an EBS volume is created for each EBS snapshot referenced by the AMI. You must have at least one snapshot that denotes the root device; the others are optional and denote additional volumes to be created from other snapshots.
- Click **Next**: **Tag Instance** to accept the default storage device configure.
- On the Tag Instance page, type a name for your instance in the **Value** box. This name, more correctly know as a tag, will appear in the console when the instance lauches. it makes it easy to keey track of running machines in a complex environment. Use a name that you can easily recognize and remember.

- Click **Next: Configure Security Group**.
  Now you will create a security group. A security group acts as afirewall that controls the traffic allowed into a group of instances. When you launch an Amazon EC2 instance, you can assign it to one or more security groups. For each security group, you add rules that govern the allow inbound trafficd to instance in the group. All other inbound traffic is discarded. You can modify rules for a security group at any time. The new rules are automatically enforced for all existing and future instances in the group.
- For **Assign a security group**, click **Create a new security group**.
- In the **Security group name** box, type the sanme name that you used for the tag.
- (Optional)type a description for your security group.
  By default, AWS creates a rle that allows Secure Shell (SSH) access from any IP address. It is *highly recommended* that you restrict terminal access to the ranges of IP addressed (e.g., IPs assigned to machines within your company) that have a legitimate business need to administer your Amazon EC2 instance.
- Click **Add Rule** to open a new port.
- In the **Type** drop-down list, click **HTTP**.
  This will add a default handler for HTTP that will allow requests from anywhere on the Internet. Since you anet this web server to be accessible to the general public, you can leave this rule as is without any further configuration.
- Click **Review and Launch**.
  NOte You may see a warning on this screen that "Your security group... is open to world." THis is a result of not restricting SSH access to your machine, as described above.
- Review your choices, and then click **Launch**.
- In the key pair dialog box, select the acknowledgment check box.
- On the stauts page, which notifies you that your instances are launching, click **View**.
  The Instance page of Amazon EC2 Dashboard displays the list of all running Amazon EC2 instances in the currently selected region. You can see the status of your instance here. If the status is not *Running*, wait a few minutes and refresh the list.
- Select your instance to display a list of details and status update in the lower pane.

1.4 Connecting to your Amazon EC2 Instance via SSH

Note This section is for OSX and Linux users only. If you are running Windows, skip to the next section.

1.4.1 Connection to the Amazon EC2 instance using the OpenSSH CLI client

- Open the Terminal application.

- Enter the following commands.
  Substitute the path/filename for the PEM file you downloanded, and paste the public DNS value from your Clipboard.
  chmod 600 ~/(your *.pem file)
  ssh -i ~/(your *.pem file) **ec2-user@**(public DNS)

1.5 Crete a PHP Web Page on Your Linux Web Server

The AMI has already been customized with the installation of Apaxhe and PHP from the script you entered as user data when the instance was launched. Modify the web server by adding an index.php file.

- Type the following into Terminal in order to create an index.php file at the root of your HTTP web server's HTML document directory:
  cd /var/www/html
  sudo vi index.php
  In the following setp, yout will paste in some PHP code that displays information about your Amazon EC2 server instance. This information is obtained from a set of HTTP-based API calls supported by service that is only available from your Amazon EC2 instance. For more information on this API, see the topic "Instance Metadata and User Data"[3] in the AWS Documentation.
- Copy the following code to a text file, and then copy it from the text file to vim:

```
<?php
  $url = "http://169.254.169.254/latest/meta-data/instace-id";
  $instance_id = file_get_contents($url);
  echo "Instance ID: <b>".$instance_id."</b><br/>";
  $url = "http://168.254.169.254/latest/meta-data/placement/availability-zone";
  $zone = file_get_contents($url);
  echo "Zone: <b>".$zone."</b><br/>";
?>
```

1.6 View Your Web Site

In this section, you will navigate to your new web site and see the content of the page that you just created.

- Reuturn to the AWS Management Console.

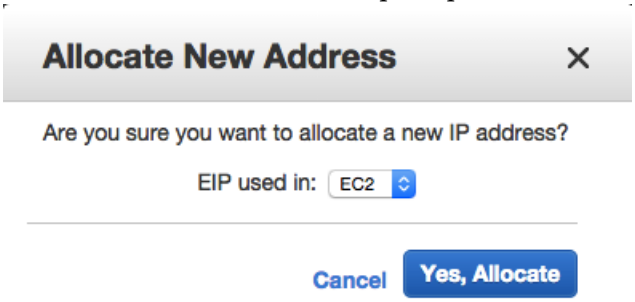
[3] http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-instance-metadata.html

- In your list of running Amazon EC2 instances, select the instance to display the instance details.
- Copy the **Public DNS** value to your Clipboard. It will look something like **ec2-52-26-247-195.us-west-2.compute.amazonaws.com**.
- Open a new browser windows, and then paste the public DNS value into the address bar. Your instance ID and Availability Zone should be displayed in the browser.

1.7 Assign a Fixed IP Address

AWS offers *Elastic IP addressed (EIPs)*, which are static IP addressed designed for dynamic cloud computing. An EIP is associated with your account, not a particular instance. You control adddresses associated with your account until you choose to expilicitly release them. EIPs are implemented as Network Address Translation (NAT) addresses that operate at a regional level, so they across Availability Zones whti a single region.

- Return to the AWS Management Console.
- In the navigation pane, click **Elastic IPs**.
- Click **Allocate New Address**.
- You will seee a comfirmation prompt. Click **YES, Allocate**.



- You will see a confirmation that a new adddress request has succeeded. CLick **Close**.
- Right-click on the allocated IP address, and select **Associate Address**.
- Click in the **Instance** box, and then click the name of your name of your instance in the drop-down list.
- CLick **Associate**.
  Th Elastic IP address has been associated with your instance.
- In the navigation pane, click **Instance**.
- In your list of running Amazon EC2 instances, slected the instance to display the instance details.
- On the **Description** tab, copy the **Elastic IP** address to your Clipboard.
- Copy the **Elastic IP** address for your instance.
- Open a new browser window, and then paste the Elastic IP adddress into the address bar. Your instance ID and Availability Zone should be displayed in the beowser.

1.8 Conclusion

- Learn about the basic concepts and terminology of Amazon Elastic Compute Cloud (EC2) service.
- Created your own Amazon EC2 server instance running Linux in the AWS cloud.
- Modified it run to a web server with a page that displays machine-specific information.
- Assigned a fixed public IP address (Elastic IP) to your instnace.