Cloud Computing for Education Workshop

How to Use Amazon Elastic Computing Cloud

What Have We Learned So Far?

• We have learned several cloud applications (Dropbox, Google Docs, Piazza, etc.)

• All the cloud applications are built on top of the cloud
  ▪ Cloud provides computing, storage, and bandwidth to the cloud applications
  ▪ The cloud has the magic power to provide unlimited computing/storage resources to the cloud applications

Hmm, any secrets inside the cloud?
SaaS vs. IaaS

- All cloud application we have seen so far are examples of using the cloud as SaaS (Software as a Service)

- Today we will look at using the cloud as IaaS (Infrastructure as a Service)

Why Are We Going to Learn Something Inside the Cloud?

- Show yourself

- May need specific applications for your teaching purpose
  - We always have the requirements for some special applications
    - Online examination system
  - The popular cloud-based services and software are designed for the general purposes
  - You have to build the special applications yourself
Why Are We Going to Learn Something Inside the Cloud?

• Access publicly available datasets
• Amazon provides a centralized repository of public data sets that can be seamlessly integrated into AWS cloud-based applications
  ▪ Annotated Human Genome Data
  ▪ Various US Census Databases from The US Census Bureau
  ▪ Enron Email Data
  ▪ Sloan Digital Sky Survey
  ▪ Million Song Sample Dataset
  ▪ Material Safety Data Sheets
  ▪ and many more…
• More details at:
  http://aws.amazon.com/publicdatasets/

Popular Public Cloud Services Providers

• Amazon Web Services (AWS)
  ▪ Computing: Amazon EC2 (Elastic Computing Cloud)
  ▪ Storage: Amazon S3 (Simple Storage Service)

• Windows Azure
  ▪ Microsoft cloud computing platform used to build, host and scale web applications through Microsoft data centers.

• Rackspace Cloud
What Are We Going to Do?

• Create a Windows Instance in Amazon EC2
  ▪ A Windows Instance is a remote machine (virtual machine) running Windows just like your own laptop

• Connect to your instance by remote desktop connection so that you can manage your own remote machine

• Build a simple application in the remote machine

Create a Windows Instance

• Open Google Chrome, go to webpage http://aws.amazon.com/
• Click “My Account/Console”, then click “My Account”
Create a Windows Instance (cont.)

• Input username and password, and then click “Sign in using our secure server”
  - Username: crix@njit.edu
  - Password: chen12345

Sign In or Create an AWS Account

You may sign in using your existing Amazon.com account or you can create a new account by selecting “I am a new user.”

- I am a new user

- I am a returning user and my password is:

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Forgot your password?
Has your e-mail address changed?
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Create a Windows Instance (cont.)

• Click “EC2”
Create a Windows Instance (cont.)

• Click “Launch Instance”

Create a Windows Instance (cont.)

• Choose “Classic Wizard”, click “Continue”
Create a Windows Instance (cont.)

Request Instances Wizard

Choose an Amazon Machine Image (AMI) from one of the tabbed lists below by clicking Select button.

- Ubuntu
  - Ubuntu Server 11.10
  - Root Device Size: 8 GB
  - 64 bit

- Microsoft Windows Server 2008 Base
  - Root Device Size: 50 GB
  - 64 bit

- Microsoft Windows Server 2008 R2 Base
  - Root Device Size: 90 GB
  - 64 bit

- Microsoft Windows Server 2008 R2 with SQL Server Express and IIS
  - Root Device Size: 30 GB
  - 64 bit

Free tier eligible if used with a micro instance. See AWS free tier for complete details and terms.

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Create a Windows Instance (cont.)

- Use all the default values for “Advanced Instance Options”

Request Instances Wizard

Number of Instances: 1
Availability Zone: No Preference

Advanced Instance Options

Kernel ID: Default
RAM Disk ID: Data
Monitoring: Enable cloudwatch detailed monitoring for this instance (additional charges will apply)
User Data: Text
Termination Protection: Prevent accidental termination
SSHd Behavior: Choose the behavior when the instance is terminated

Fill your first name here
Create a Windows Instance (cont.)

- Click “Create a new Key Pair”

Choose this security group

Fill your first name here

Click and then save your private key to a location which you can easily memorize (e.g., your Desktop). You need this key later.
Create a Windows Instance (cont.)

- Review the information (Please don’t click “Launch” on the bottom before I have checked your instance information)

Launch Instance Wizard

- Your instances are now launching.
  Note: Your instances may take a few minutes to launch, depending on the software you are running.
  Note: Usage hours on your new instance will start immediately and continue to accrue until you stop or terminate your instance.

View your instances on the Instances page

Other AWS Features

- Spot Instances
  Spot Instances enable customers to lower their Amazon EC2 costs by up to 75% by bidding on unused capacity and running instances for as long as the minimum bid exceeds the current Spot Price.

  Go to Amazon EC2 Spot Instances

- Reserved Instances
  Reserved instances provide substantial savings over on-demand instances and ensure that the capacity you need is available to you when required.

  Go to Amazon EC2 Reserved Instances

- SUSE Linux Instances
  SUSE Linux instances are a proven platform with superior reliability and security and are automatically kept up to date with SUSE's security patches, bug fixes and new features.

  Go to Amazon EC2 running SUSE Linux

Close
Create a Windows Instance (cont.)

- You can find the instance created by you identified by your first name. Please only operate the instance identified by your first name. And don’t take any operation before we continue.

The newly created instance needs around 10 minutes for initialization.

Connect to the Windows Instance

- Right click the instance identified by your first name (don’t click other people’s instances, since you don’t have other people’s private keys, and you cannot access them)
- Click “Connect”
Connect to the Windows Instance

• Retrieve your password for the remote machine

Log in to your instance with your credentials:

Public DNS: ec2-23-22-141-208.compute-1.amazonaws.com
Username: Administrator
Password: [Retrieve Password]

You can download an RDP file for this instance which will launch Remote Desktop Connection and connect to your instance. You will need to note down your password because the Remote Desktop Connection software will open in a new window.

Download shortcut file

If you need help configuring your remote desktop software, click here.

Retrieving Windows Administrator password
Need help configuring your remote access software?

Connect to the Windows Instance (cont.)

• Click “Choose File”, and select the private key you stored previously. Then click “Decrypt Password”
Connect to the Windows Instance (cont.)

• Copy and paste your remote machine information

  Console Connect - Remote Desktop Connection

  Instance: B0  Public DNS: ec2-23-22-141-208.compute-1.amazonaws.com

  Log in with your credentials

  Log in to your instance with your credentials:
  Instance: B0  Public DNS: ec2-23-22-141-208.compute-1.amazonaws.com
  Username: Administrator
  Password: CONTINUE1G7

  Note: If you are having problems with your decrypted password, try typing it instead of using copy and paste.

  You can download an RDP file for this instance which will launch Remote Desktop Connection and connect to your instance. You will need to note down your password because the Remote Desktop Connection software will open in a new window.

  Download shortcut file

  If you need help configuring your remote desktop software, click here.

  Retrieve Windows Administrator password
  Need help configuring your remote access software?

  Close

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Connect to the Windows Instance (cont.)

• Click “Download shortcut file”, and store the corresponding file to a location which you can easily memorized, e.g., your Desktop

  Console Connect - Remote Desktop Connection

  Instance: B0  Public DNS: ec2-23-22-141-208.compute-1.amazonaws.com

  Log in with your credentials

  Log in to your instance with your credentials:
  Instance: B0  Public DNS: ec2-23-22-141-208.compute-1.amazonaws.com
  Username: Administrator
  Password: CONTINUE1G7

  Note: If you are having problems with your decrypted password, try typing it instead of using copy and paste.

  You can download an RDP file for this instance which will launch Remote Desktop Connection and connect to your instance. You will need to note down your password because the Remote Desktop Connection software will open in a new window.

  Download shortcut file

  If you need help configuring your remote desktop software, click here.

  Retrieve Windows Administrator password
  Need help configuring your remote access software?

  Close

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Connect to the Windows Instance (cont.)

- Double click the file you have just downloaded
- Click “Administrator” account, and input the machine password you have got previously. You will see the following picture if you successfully log in

Do Whatever You want in Your Windows Instance

- It is now your own remote machine. You can do whatever you want
Hands-on tasks

• Build a simple webpage in your remote machine (an instance in Amazon cloud)

A bit more on the AWS public data sets

• Public Data Sets on AWS provides a centralized repository of public data sets that can be seamlessly integrated into AWS cloud-based applications.
• AWS is hosting the public data sets at no charge for the community, and like all AWS services, users pay only for the compute and storage they use for their own applications.
• Previously, large data sets such as the mapping of the Human Genome and the US Census data required hours or days to locate, download, customize, and analyze.
• Now, anyone can access these data sets from their Amazon Elastic Compute Cloud (Amazon EC2) instances and start computing on the data within minutes.
• Users can also leverage the entire AWS ecosystem and easily collaborate with other AWS users.
Amazon Teaching Grants

• To assist educators around the world in providing cloud computing instruction, AWS offers Teaching Grants supporting free usage of AWS for students in eligible courses.

• If you are awarded a Teaching Grant, each students’ $100 credit will be good for up to 1 year from the time AWS confirms your grant award

http://aws.amazon.com/education/

• In addition, anyone can open a new AWS account and they will have by default credits for free to use 1 Amazon EC2 Micro Instance for 1 year