Trading From Cloud

Prerequisites

Trading From Cloud

Before we begin our session on *Trading From Cloud* there are few prerequisites as listed below. Some of us might be already aware about these, but for those who are trying Cloud services for the first time, let's go through each one by one.

Prerequisite
1. Basic understanding of Linux and Ubuntu server.
2. Basic understanding of Cloud computing (eg: AWS).
3. Minimal understanding of VNC client.
4. Understanding of Jupyter Notebook.
5. SSH client (optional).
6. FTP client (optional).

Basic understanding of Linux and Ubuntu server.

- Linux
    - Linux is an operating system's kernel.
    - Linux is mainly used in servers. Most of the internet is powered by Linux servers. This is because Linux is fast, secure, and free.
    - There are many free open source linux based operating system available, for our session we are going to use ubuntu server.

- Ubuntu server
    - Ubuntu server is just another free operating system which is powered by linux.
    - It comes with everything we need to run our organisation, school, home or enterprise. All the essential applications.
    - Ubuntu server is different from Ubuntu desktop, Ubuntu server does not have a Graphical user interface (GUI).
    - In case of Ubuntu server all commands, applications and programs are executed via Terminal or Command line.

- Terminal / Shell / Command line
    - This is one of key component in linux based systems. It may be referred as Terminal or Shell or Command line or Command line interface (CLI).
    - Terminal is usually a black blank screen where one can execute commands and see the output.
    - It is a text-based interface that is used to operate software and operating systems while allowing the user to respond to visual prompts by typing commands into the interface and receiving a reply in the same way.

- SSH login
    - As ubuntu server does not comes with GUI, we have to login into the server using Terminal on our local machine (computer) using either password or key file.

Basic understanding of Cloud Computing (eg: AWS).

- Cloud computing
    - Cloud computing means that instead of all the computer hardware and software we are using sitting on our desktop, it's provided for us as a service by another company and accessed over the Internet. It is just like using a remote computer.
    - For our session we are going to use Amazon Web Services (AWS).

- Amazon Web Services (AWS)
    - AWS is most popular and widely used cloud service provider. AWS offers reliable, scalable, and inexpensive cloud computing services. Free to join, pay only for what we use.
    - AWS comes with many components and services. But we will focus only on following ones.
        - AWS account creation and free Tier.
        - AWS Management console.
        - EC2 and Types of EC2.
        - EC2 Launch / Start / Stop.
        - Security Groups and usage of security groups.
        - SSH login into EC2.

    AWS account creation and free tier
        - We can create a free account on AWS and get advantage of free tier given by AWS.
        - AWS - Getting started -> https://aws.amazon.com/getting-started/
        - AWS - Free Tier -> https://aws.amazon.com/free/

    AWS Management console
        - Access and manage Amazon Web Services through a simple and intuitive web-based user interface.
        - Read more on -> https://aws.amazon.com/console/

EC2 and Types of EC2
- EC2
    - EC2 stands for Elastic Compute Cloud (EC2). It is virtual machine (computer) which is customizable and scalable.
- Types of EC2
    - We can choose from various types of hardware configurations as per our need.
    - Eg: t2.nano (1 CPU, 0.5GB RAM), t2.micro (1 CPU, 1GB RAM), t2.small (1 CPU, 2GB RAM), t2.medium (2CPU, 4GB RAM)
- Choosing a Type of EC2
    - <u>For taking advantage of Free tier an EC2 instance type of t2.micro for 750 hours/month for 12 months can be a good choice</u>.
    - Depending on our requirements we can opt for more hardware backed types of Ec2.
- Read more about types of EC2 and Pricing
    - https://aws.amazon.com/ec2
    - https://aws.amazon.com/ec2/instance-types/
    - https://aws.amazon.com/ec2/pricing/

EC2 Launch / Start / Stop
- Amazon Machine Images (AMI)
    - AMI are like copies of machines (computer) which are ready for us to use.
    - AMI acts as source from which we can launch (create) number of machines as per our need.
    - Read more on AMI -> https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AMIs.html
- <u>Choosing AMI</u>
    - We can choose from multiple AMI available on AWS marketplace. Eg: Ubuntu, Centos, etc.
    - For our session we will choose AMI which we have already created with all required software installed and ready to use.
- Launching an EC2 instance
    - To launch an EC2 instance we will make use of AWS management console.
    - Simply click on EC2 Dashboard and select Launch Instances and follow the steps.
    - Read more on Launching EC2 -> https://aws.amazon.com/ec2
- Starting and Shutting Down EC2 instance
    - Once the EC2 is launched we can manage via the AWS management console (EC2 Dashboard).

Security Groups and usage of security groups
- Security Groups
    - Security groups acts as a Firewall of your EC2.
- Usage
    - By Default a security group is added during launching of EC2 instance.
    - It consist of IP addresses which we want to allow to have access to our EC2 instance.
    - Security groups should be modified with care as it can allow unwanted access to our servers.
- Read more on AWS Security Groups
    - https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/using-network-security.html#ec2-classic-security-groups

SSH login into EC2
    - By default EC2 provides a key based authentication to connect with it.
    - Detailed explaination is given here ->
      https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AccessingInstances.html

Minimal understanding of VNC client.
- VNC client
    - Virtual Network Computing (VNC) is a graphical desktop sharing system.
    - VNC client must be installed on your system in order to share the desktop.
    - There are many VNC clients available to download based on your operating system.
    - Some popular free vnc clients are listed below:
        - https://www.realvnc.com/en/connect/download/viewer/
        - https://www.tightvnc.com/download.php

Understanding of Jupyter Notebook.
- Jupyter Notebook (http://jupyter.org/)
    - The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.
    - Documentation: http://jupyter.org/documentation

SSH client (optional).
- An SSH client is a software program which uses the secure shell protocol to connect to a remote computer.
- It is just like opening a Terminal of remote computer on your local computer.
- Some popular SSH Client are listed below for us to download.
- WinSCP (windows) -> https://winscp.net/eng/docs/free_ssh_client_for_windows
- Putty (windows) -> https://www.putty.org/

FTP client (optional).
- A File Transfer Protocol client (FTP client) is a software utility that establishes a connection between a host computer and a remote server. FTP client provides the dual-direction transfer of data and files between two computers over a TCP network or an Internet connection.
- Some popular FTP Client are listed below for us to download.
- FileZilla -> https://filezilla-project.org/download.php?type=client
- WinSCP (windows) -> https://winscp.net/eng/docs/free_ssh_client_for_windows