DevOps

### ASSIGNMENT – 1

Linux Commands :-

|  |  |  |
| --- | --- | --- |
| **File Commands** | | |
| **1.** | ls | Directory listing |
| **2.** | ls -a | Directory listing with hidden files |
| **3.** | ls -l | Directory listing with permission info. |
| **4.** | Cd | Change Directory |
| **5.** | pwd | Shows current working directory |
| **6.** | mkdir [filename] | To create new directory |
| **7.** | rmdir [filename] | To delete directory |
| **8.** | cat [filename] | To display the contents of one or multiple text files,  to create new file |
| **9.** | touch [filename] | Create a file with timestamp |
| **9.** | head [filename] | Output the first 10 lines of the file |
| **11.** | tail [filename] | Output the last 10 lines of the file |
| **12.** | rm [filename] | Delete the file |
| **13.** | rm -r [filename] | Delete the directory |
| **14.** | cp [source] [destination] | Copy the source and paste to the destination |
| **15.** | mv [source] [destination] | Move the source file to the destination |
| **16.** | ln -s [filename] [link name] | To create soft link |
| **17.** | ln [filename] | To create hard link |
| **18.** | cmp file1 file2 | To compare files |
| **19.** | diff file1 file2 | Difference between files |
| **20.** | sort [file] | Sort the data of file |
| **21.** | wc [file] | Word count |
| **22.** | scp | Secure copy file |

|  |  |  |
| --- | --- | --- |
| **Process Management Commands** | | |
| **1.** | ps | To display the currently working processes |
| **2.** | top | Display all running process |
| **3.** | Kill [pid] | To kill the process |
| **4.** | free | Show memory and swap usage |

|  |  |  |  |
| --- | --- | --- | --- |
| **Searching** | | | |
| **1.** | grep pattern file | | Search for pattern in file |
| **2.** | command | grep pattern | | Search pattern in the output of a command |
| **3.** | locate [file] | | Find all instances of file |
| **4.** | find -name [filename] | | Searches the file in the current directory |
|  |  | |  |
|  | **System Information** | |  |
| **1.** | date | | Show the current date and time |
| **2.** | cal | | Show the calender |
| **3.** | uptime | | Show the current uptime(session time) |
| **4.** | whoami | | Show user logged in as |
| **5.** | uname | | Show kernel info |
| **6.** | man [] | | Manual of everything comes with os |
| **7.** | df | | Show the disk usage |
| **8.** | du | | Show directory space usage |
| **9.** | top | | Show info like tasks, memory, cpu and swap |
|  | | |  |
| **USER Management** | | |  |
| **1.** | | useradd [user name] | To add user |
| **2.** | | passwd [user name] | To change the password |
| **3.** | | userdel [user name] | To remove the user |
| **4.** | | groupadd [group\_name] | To add new group |
|  | | usermod -aG [group\_name]  [user\_name] | To add user to group |
|  | | groupdel [group\_name] | To delete group |

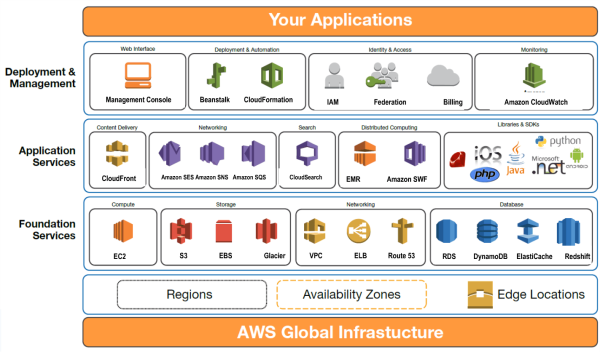
|  |  |  |
| --- | --- | --- |
| **Network** | | |
| **1.** | ifconfig | Ip configuration |
| **2.** | ping [ip] | To check ip is UP or Down |
| **3.** | wget | Used to download file from internet |
| **4.** | netstat | To show network statistics |

|  |  |  |
| --- | --- | --- |
| **Others** | | |
| **1.** | Sudo [service-name] start OR  sudo systemctl start [service name] | To start a service |
| **2.** | Sudo [service-name] stop OR  sudo systemctl stop [service name] | To stop a service |
| **3.** | dpkg -i file.deb [debian]  rpm -i file.rpm [CentOS] | Installing a package from a  compiled file. |
| **4.** | apt install package\_name [Debian]  yum install package\_name [CentOS] | Installing from repository |
| **5.** | tar and zip/unzip | Compressing /  uncompressing files. |
| **6.** | 1. chmod [user/group/others [+/-] permission] [file\_name],   To give permission use [+],  To remove permission use [-], permissions = read, write and execute OR   1. chmod [3 digit numeric] [file\_name] Read = 4   Write = 2  Execute = 1  Eg. Chmod 777 file.py | Permission to a file |
| **7.** | crontab  crontab -l (list of jobs) crontab -e (to modify)  crontab -r (remove all cron jobs)  crontab -r -u [username] (to remove specific user job) | It is used to schedule tasks.  \*\*\*\*\*  M,H,D,Mn,WD respectively  M = Minute H = Hours  D = Day of the month Mn = Month of the year  WD = Week day |
| **8.** | sed | Stream editor |

**# AWS (Amazon Web Services)**

AWS (Amazon Web Services) is a comprehensive, evolving cloud computing platform provided by Amazon that includes a mixture of infrastructure as a service (IaaS), platform as a service (PaaS) and packaged software as a service (SaaS) offerings. AWS services can offer an organization tools such as compute power, database storage and content delivery services.

# Services in AWS



1. **Elastic Compute Cloud (EC2)**
   1. EC2 provides scalable computing capacity in the AWS cloud. Using Amazon EC2 it eliminates your need to invest in hardware up front So, you can develop and deploy applications on cloud.
   2. We can use amazon ec2 o launch as many as virtual machine as according to need
   3. Amazon EC2 enables you to scale up or scale down the instance
   4. Amazon EC2 is having two storage option i.e. EBS and instance state

# Horizontal and Vertical scaling :-

**Vertical Scaling:** When new resources are added in the existing system to meet the expectation, it is known as vertical scaling. Consider a rack of servers and resources that comprises of the existing system. Now when the existing system fails to meet the expected needs, and the expected needs can be met by just adding resources, this is considered as vertical scaling. Vertical scaling is not only easy but also cheaper than Horizontal Scaling. It also requires less time to be fixed.

**Horizontal Scaling:** When new server racks are added in the existing system to meet the higher expectation, it is known as horizontal scaling. Consider a rack of servers and resources that comprises of the existing system. (as shown in the figure). Now when the existing system fails to meet the expected needs, and the expected needs cannot be met by just adding resources, we need to add completely new servers.

This is considered as horizontal scaling.

# Instance Types :-

## General Purpose :-

General purpose instances provide a balance of compute, memory and networking resources, and can be used for a variety of diverse workloads. General purpose instance types are :-

* + 1. T2
    2. T3
    3. T4g
    4. Mac
    5. M5
    6. M5a
    7. etc

## Compute Optimized :-

Compute Optimized instances are ideal for compute bound applications that benefit from high performance processors. Instances belonging to this family are well suited for batch processing workloads, media transcoding, high performance web servers, high performance computing (HPC), scientific modelling, dedicated gaming servers and ad server engines, machine learning inference and other compute intensive applications.

Compute Optimized instance types are :-

* + 1. C4
    2. C5n
    3. C5a
    4. C5
    5. C6g
    6. etc

## Memory Optimized :-

Memory optimized instances are designed to deliver fast performance for workloads that process large data sets in memory.

Memory Optimized instance types are

* + 1. R6g
    2. R5
    3. R5a
    4. R5b
    5. R5n
    6. Etc

## Accelerated Computing :-

Accelerated computing instances use hardware accelerators, or co- processors, to perform functions, such as floating point number calculations, graphics processing, or data pattern matching, more efficiently than is possible in software running on CPUs.

Accelerated computing instance types are :-

* + 1. P4
    2. P3
    3. P2
    4. Inf1
    5. G4dn
    6. etc

## Storage Optimized :-

Storage optimized instances are designed for workloads that require high, sequential read and write access to very large data sets on local storage. They are optimized to deliver tens of thousands of low-latency, random I/O operations per second (IOPS) to applications.

Storage optimized instance types are :-

* + 1. I3
    2. I3en
    3. D2
    4. D3
    5. D3en
    6. H1

# Elastic IP :-

An Elastic IP address is a static IPv4 address designed for dynamic cloud computing. An Elastic IP address is allocated to your AWS account, and is yours until you release it. By using an Elastic IP address, you can mask the failure of an instance or software by rapidly remapping the address to another instance in your account An Elastic IP address is a public IPv4 address, which is reachable from the internet. If your instance does not have a public IPv4 address, you can associate an Elastic IP address with your instance to enable communication with the internet. For example, this allows you to connect to your instance from your local computer.

# Security Groups :-

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. When you launch an instance in a VPC, you can assign up to five security groups to the instance. Security groups act at the instance level, not the subnet level. Therefore, each instance in a subnet in your VPC can be assigned to a different set of security groups.

# EBS and Types :-

Amazon Elastic Block Store (EBS) is an easy to use, high-performance, block- storage service designed for use with Amazon Elastic Compute Cloud (EC2) for both throughput and transaction intensive workloads at any scale. A broad range of workloads, such as relational and non-relational databases, enterprise applications, containerized applications, big data analytics engines, file systems, and media workflows are widely deployed on Amazon EBS

# Types :-

1. SSD-based volumes
2. HDD-based volumes