

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(seesion time)
4.	whoami	Show user looged 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.	a) chmod [user/group/others [+/-] permission] [file_name], To give permission use [+], To remove permission use [-], permissions = read, write and execute OR b) 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.

(i) Services in AWS

Migrate				
	AWS Snowball	AWS Server Migration Service	AWS Database Migration Service	AWS Application Discovery Service
Compute				
	AWS Lambda	Amazon Elastic Container Service	AWS Fargate	
Database				
	Amazon RDS	Amazon DynamoDB	Amazon ElastiCache	Amazon Aurora Serverless
Developer Tools				
	AWS CodePipeline	AWS CodeBuild	AWS CodeDeploy	
Management & Governance				
	Amazon CloudWatch	AWS CloudFormation	AWS Config	AWS CloudTrail
Security & Compliance				
	Amazon GuardDuty	Amazon Macie	Amazon Inspector	

(ii) Elastic Compute Cloud (EC2)

- (i) 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.
- (ii) We can use amazon ec2 o launch as many as virtual machine as according to need
- (iii) Amazon EC2 enables you to scale up or scale down the instance
- (iv) Amazon EC2 is having two storage option i.e. EBS and instance state

(a) 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.

(b) Instance Types :-

(i) 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 :-

- i) T2
- ii) T3
- iii) T4g
- iv) Mac
- v) M5
- vi) M5a
- vii) etc

(ii) 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 :-

- i) C4
- ii) C5n
- iii) C5a
- iv) C5
- v) C6g
- vi) etc

(iii) 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

- i) R6g
- ii) R5
- iii) R5a
- iv) R5b
- v) R5n
- vi) Etc

(iv) 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 :-

- i) P4
- ii) P3
- iii) P2
- iv) Inf1
- v) G4dn
- vi) etc

(v) 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 :-

- i) I3
- ii) I3en
- iii) D2
- iv) D3
- v) D3en
- vi) H1

(c) 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.

(d) 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.

(e) 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 :-

- i) SSD-based volumes
- ii) HDD-based volumes