DevOps with AWS QA

Document Version: 0.0.1

Document Date: 28/12/2022

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Questions with Answers

What CMD is required to create directory

To Create a directory in Linux.

mkdir <DIR_NAME>

What CMD is required to create multiple directories

To Create a directory in Linux.

mkdir -p <DIR_NAME_1> <DIR_NAME_2> <DIR_NAME_3>

What CMD is required to create file

There are 3 ways to create a file in Linux.

Touch – It is used to create empty files.

touch <filename> == To create the empty file

touch <filename-1> <filename-2> <filename-3> == To create empty multiple files

Cat – Cat CMD is a multipurpose utility in the Linux system. It can be used to create a file, display content of the file, copy the content of one file to another file.

cat > <file_name> == To create the file

cat <file_name> == To display the content.

Vim – Vim is a text editor that is an upgraded version of the Vi editor and is more compatible with Vi.

Step 1: vim file_name.txt

Step 2: To insert data click on insert / i.

Step 3: Type content / data

Step 4: Save and exit the editor. **[Esc] +: wq**

What CMD is required to create multiple files

To create multiple files in Linux.

touch file{01-28}.txt

How to check the specific file or directory in LINUX

Using color method and permission method we can decide whether it is a file or directory in Linux.

If permission starts with '**d**' or if it is color **blue**, then we can decide it's directory.

For Example, in Linux:

drwr-xr-x— 4 rootuser username 128 Dec 25 05:15 Sai

If permission starts with '**r**' or if it is color **green**, then we can decide it's file.

rwr-xr-x— 4 rootuser username 128 Dec 25 05:15 hello.txt

What is the difference between cat and vim

Vim	Cat
Vim editor opens an editor tool to work.	It works on the dollar prompt itself.
Vim editor works with three modes – command, insertion, execution mode.	There is no concept of modes in the cat command.
Using Vim editor, the content of the files can be edited throughout the file.	Using cat command, the contents of a file cannot be edited.
Contents of multiple files cannot be copied at a time.	Contents of multiple files can be copied at a time.
A file can merged but only with the one being currently edited.	Merging multiple files is easy and can be done through single command.
In case the system crashes, vim editor let’s one save versions of the file.	There is no scope for saving files that can be edited later.

What is the difference between grep and egrep

Grep	Egrep
A command-line utility for searching plain-text data sets for lines that match a regular expression.	A variation of grep that is available in operating systems to perform searching using extended regular expression.
Represents Global Regular Expression Print	Represents Extended Global Regular Expression Print
Uses regular expressions for searching	Uses extended regular expressions for searching
Consider +,?,|, etc as patterns. It is required to use them with a backslash to treat them as meta characters eg - \?, \+, \{, \}	Consider +, ?, | etc. as meta characters

Why are we using move command in Linux

mv stands for move. mv is used to move one or more files or directories from one place to another in a file system like Linux. It has two distinct functions:

- It renames the file or folder.
- It moves a group of files to a different directory.

Syntax: mv [option] source destination

What is the difference between tail and head

As their names imply, the head command will output the first part of the file, while the tail command will print the last part of the file. Both commands write the result to standard output.

Examples for Head:

Eg1: head file1.txt == Displays top 10 lines, and default value is 10.

Eg2: head -n 30 file1.txt or head -30 file1.txt

To display top 30 lines of the file. Instead of 30 we can specify any number.

Eg3: head -n -20 file1.txt == To display all lines of file but except last 20 lines.

Eg4: head -c 100 file1.txt == To display first 100 bytes of the file content.

Examples for Tail:

Eg1: tail file1.txt == Displays last 10 lines of the file.

Eg2: tail -n 30 file1.txt or tail -30 file1.txt or tail -n -30 file1.txt

It will display last 30 lines.

Eg3: tail -n+4 file1.txt == It will display from 4^{th} line to last line.

Eg4: tail -c 200 file2.txt == Displays 200 bytes of content from bottom of the file.

What is “tail -F”

What is “tail -f”

What is “sed” command

SED is text stream editor used on Linux systems to edit files quickly and efficiently. The tool searches through, replaces, add, and deletes lines in a text file without opening the file or text editor.

Syntax: sed OPTIONS [SCRIPT] [INPUTFILE]

Why are we using “awk” command

AWK is mostly used for pattern scanning and processing. It searches one or more files to see if they contain lines that matches with the specified patterns and then perform the associated actions.

AWK is abbreviated from the names of developers – **Aho**, **Weinberger**, and **Kernighan**.

What is the difference between awk and grep

GREP is used for finding text patterns in a file and is the simplest of the three.

AWK is fully fledged programming language that can process text comparison and arithmetic operations on the extracted text.

Why are we using “top” command

Top command is used to show the Linux processes. It provides a dynamic real-time view of the running system. Usually, this command shows the summary information of the system and the list of processes or threads which are currently managed by the Linux Kernel.

Why are we using “ps -ef” command

What is the command to kill PID

How to modify time & date in Linux

What type of content will be available in bin, sbin, etc, process, dev, temp and var

/	• This is top level directory. • It is parent directory for all other directories. • It is called as ROOT directory. • It is represented by forward slash (/)
/root	• It is home directory for root users (Super User). • It provides working environment for root user.
/home	• It is home directory for other users. • It provides working environment for other users (other than root)
/boot	• It contains bootable files of Linux. • Like vmlinux (Kernel) …… ntoskrnl Initrd (Initial Ram Disk). • Like GRUB (Grand Unified Boot Loader) … boot.ini, ntldr.
/etc	It contains all configuration files
/usr	By default, software's are installed in /usr directory. (UNIX Sharable Resources)
/opt	• It is optional directory for /usr. • It contains third-party software's.
/bin	It contains commands used by all users. (Binary Files)

/sbin	It contains commands used by only Super User (root). (Super User's binary files)
/dev	It contains device files. Like for hard disk /dev/hda, for cd rom /dev/cd. Like device manager of windows.
/proc	• It contains process files. Its contents are not permanent, they keep changing. • It is also called as Virtual Directory. • Its file contains useful information used by OS. • Like information of RAM/SWAP - /proc/meminfo. • Like information of CPU - /proc/cpuinfo
/var	It contains variable data like mails, log files.
/tmp	It contains the temporary files for small period time.
/mnt	• It is default mount point for any partition. • It is empty by default.
/media	It contains all removable media like CD-ROM, pen-drive.
/lib	• It contains library files which are used by OS. • It is like dll files in Windows. • Library files in Linux are SO (Shared Object) files.

What is the difference between soft link and hard link

Hard Link:

Hard Link is just another name of the same exact file. We can create hard link file by using a command.

Eg: ln file1.txt file2.txt == file1.txt is original and file2.txt is hard link

Both original and hard-link file have same inode number, same size, and same timestamp.

If we delete original file, then there is no effect on hard link file.

Soft Link:

A Soft Link is a pointer to another file. It is just like windows shortcut. It is also known as symbolic link. We can create soft link file by using command but with **-s** option.

Eg: ln -s file5.txt file777.txt == file5.txt is original, whereas file777.txt is link file.

Original file and soft link file have different inode number, different file sizes, and different timestamps.

Usually, soft link file has smaller file size than original file size.

If we delete original file, then soft link files become useless.

What is the full form of grep

Global Regular Expression Print (GREP)

What is CCNA

The CCNA – stands for Cisco Certified Networking Associate is an entry-level information technology (IT) certification issued by networking hardware company Cisco.

The CCNA is designed to validate your knowledge on fundamental networking concepts often requested in networking roles in IT positions.

Cisco is worlds most famous company for manufacturing and selling networking equipment. This certification helps you to become familiar with a wide range of topics, such as:

- LAN/WAN
- TCP/IP model
- Switches and routers
- Network utilities (ping, tracert, arp)
- IP addressing and subnetting
- VLANs and trunking
- Routing protocols such as OSPF
- WLAN
- NAT and ACLs
- Automation and programmability

Why port no is required in networking

A port no is a way to identify a specific process to which an internet or other network message is to be forwarded when it arrives at a server.

All networked-connected devices come equipped with standardized ports that have an assigned number.

What is the necessity of the port no

Using ports for remote access is the most prevalent use case. Two cameras on the same network, connected through the same router (your router has a single external IP address that is accessible from the internet), and you want to be able to access both cameras remotely, which are both on port 80.

What is CIDR Range

CIDR stands for Classes Inter-Domain Routing or supernetting. It is based on Variable-Length Subnet Masking (VLSM), in which prefixes have variable length. The main benefit of this is that it grants finer control of the sizes of subnets allocated to organizations, hence slowing the exhaustion of IPV4 addresses from allocating larger subnets than needed.

It is a method for allocating IP addresses and for IP Routing.

IP addresses are described as consisting of two groups of bits in the address: the most significant bits are the network prefix, which identifies a whole network or subnet, and the least significant set forms the host identifier, which specifies a particular interface of a host on that network.

What is Elastic IP & its necessity

An Elastic IP (EIP) address is more of a static IPV4 address that is designed for dynamic cloud computing. The main purpose of these Ips is to mask the failure of software or instances from your AWS account.

Characteristics of Elastic IP:

As mentioned earlier, these IP addresses are static; so, they cannot be changed over time.

To use these Ips, the first step is to allocate an address to your AWS account.

The next step is to associate with the network interface or your instances.

The public IPV4 address of an instance will be released if you associate the Elastic IP with the instance; that IPV4 address will be released to Amazon’s pool of public IPV4 addresses.

The Elastic IP address will either be from custom IP pool that you brought to your AWS account or from AWS’s own pool of IPV4 addresses.

If the used IP address is from your custom IP pool, then it will not be considered for Elastic IP address limits.

How many types of Elastic IP are present

The internet recognizes you by your public IP address. A public IP address is an address that your internet - connected device uses to communicate with the rest of the internet.

There are 5 types of Elastic IP

What is the difference between public IP and private IP and write its use cases.

Public IP:

It is allocated from a pool of available IPs, and it is mandatory to let you connect from anywhere around the globe to your EC2 Instances. It is of a system IP address that is used to communicate outside the network.

A public IP address is basically assigned by the ISP (Internet Service Provider)

Private IP:

Its allocation is based on VPC/subnet in which EC2 is setup. Every subnet has a range of IP's, out of which one IP gets allocated to the launched EC2.

Scope or visibility of this IP is only under the defined VPC.

It is of a system the IP address that is used to communicate within the same network. Using private IP data or information can be sent or received within the same network.

What is the difference between IPV4 and IPV6

IPV4 and IPV6 are internet protocol version 4 and version 6, IP version 6 is the new version of the internet protocol, which is way better than IP version 4 in terms of complexity and efficiency.

It has a 32-bit address length.	It has a 128-bit address length
In IPV4 end to end, connection integrity is Unachievable	In IPV6 end to end, connection integrity is Achievable
The security feature is dependent on application.	IPSEC is an inbuilt security feature in IPV6 protocol.
It can generate 4.29*10^9 address space	It can generate 3.4*10^38 address space
Address representation is in decimal	Address representation is in hexadecimal
IPV4 consists of 4 fields which are separated by dot (.)	IPV6 consists of 8 fields, which are separated by colon (:)
It is supports VLSM	IPV6 does not support VLSM

What is InBound and OutBound rules in networking states and its difference’s

Inbound Rule:

It rules the incoming traffic to your instance.

Outbound Rule:

It rules the outgoing traffic from your instance.

This rule is added only if your VPC has an associated CIDR block.

What is the purpose of security in networking

Network security protects your network and data from breaches, intrusions, and other threats.

This is a vast and overarching term that describes hardware and software solutions as well as processes or rules and configurations relating to network use, accessibility, and overall threat protection.

Befits of Network Security:

- Builds Trust. Security for large systems translates to security for everyone.
- Mitigates risk.
- Protects proprietary information
- Enables a more modern workplace
- Access Control
- Antivirus and anti-malware software
- Application security
- Behavioural analytics

Create a minimum five groups and attach 10 users in each and detect all their group id, uid, encrypted password of each

Step1: Creating Group

groupadd <group_name>

e.g.: groupadd sai

Below example shows list of groups added, sai1, sashreek1, ayyansh1, aarav1, ashish1 are groups which were created.

[root@ip-172-31-38-33 etc]# tail group

stapdev:x:158:

screen:x:84:

tcpdump:x:72:

ec2-user:x:1000:

sai:x:1001:

sai1:x:1002:

sashreek1:x:1003:

ayyansh1:x:1004:

aarav1:x:1005:

ashish1:x:1006:

Step2: Creating Username

useradd <user_name>

e.g.: useradd sai

Below example explains the path of the user.

sai:x:1001:1001::/home/sai:/bin/bash

sai -------- user name

x --------- Account is protected with shadow password

1001 ------ This is UID (User ID)

1001 ----- This is GID (Group ID)

::/home/sai – Location Path

/bin/bash – Shell script path

Below is the user shadowed password

CMD: cat /etc/shadow

sai:!!:19358:0:99999:7:::

Add the users in specific groups take out their min-age, max-age and alter these days by your convivence

Date:- 04/01/2023

What is Source Code Management System

Source Code Management SCM is used to track modifications to a source code repository. SCM tracks a running history of changes to a code base and helps resolve conflicts when merging updates from multiple contributors.

It is a software tool that programmers use to manage source code. It tracks modifications to a source code repository and helps deal with merge conflicts.

Importance of Source Code Management

- Track Changes
- Synchronization
- Backup & Restore
- Undoing
- Branching & Merging
- Identify Conflicts & Preventing Overwrites

What is Version Control System

Version Control is also known as Source Control, is the practice of tracking and managing changes to software code. Version Control systems and software tools that help software team manage changes to source code over time.

Version Control software keeps track of every modification to the code in a special kind of database. If a mistake is made, developers can turn back the clock and compare earlier versions of the code to help fix the mistake while minimizing disruption to all team members.

What is the necessity of Version Control System

Using version control software is a best practice for high performing software and DevOps teams. Version Control also helps developers move faster and allows software teams to preserve efficiency and agility as the team scales to include more developers.

VCS have seen great improvements over the past few decades, and some are better than others. VCS are sometimes known as Source Code Management (SCM) tools or Revision Control System (RCS).

One of the most popular VCS tools in use today is called GIT.

What are the types of Version Control System

There are 3 types of Version Control System.

- Local Version Control System
- Centralized Version Control System
- Distributed Version Control System

Local Version Control System:

A local version control system is a local database located on your local computer, in which every file change is stored as a patch. The main problem with this is that everything is stored locally. If anything were to happen to the local database all the patches would be lost.

Also, collaborating with other developers or a team is very hard or nearly impossible.

Centralized Version Control System:

A centralized version control system has a single server that contains all the file versions. This enables multiple clients to simultaneously access files on the server, pull them to their local computer or push them onto the server from their local computer.

This allows for easy collaboration with other teammates.

Distributed Version Control System:

Distributed Version Control System, clients don't just check out the latest snapshot of the files from the server, they fully mirror the repository, including its full history. Thus, everyone collaborating on a project owns a local copy of the whole project, i.e., owns their own local database with their own complete history.

What is the difference between central & distributed version control system

Central Version Control System	Distributed Version Control System
In CVS, a client needs to get local copy of source from server, do the changes and commit those changes to central source on server.	In DVS, each client can have a local branch as well and have a complete history on it. Client needs to push the changes to branch which will then pushed to the server repository.
CVS systems are easy to learn and setup.	DVS systems are difficult for beginners. Multiple commands need to be remembered.
Working on branches in difficult in CVS. Developer often faces merge conflicts.	Working on branches in easier in DVS. Developer faces lesser conflicts.
CVS system do not provide offline access.	In DVS systems are workable offline as a client copies the entire repository on their local machine.
CVS is slower as every command need to communicate with server.	DVS is faster as mostly user deals with local copy without hitting server anytime.
If CVS Server is down, developers cannot work.	If DVS server is down, developer can work using their local repository.

What are the demerits of Central Version Control System

The biggest dis-advantage is the single-point of failure embedded within the centralized server.

If the remote server goes down, then no one can work on the code or push changes.

The lack of offline access means that any disruption can significantly impact code development and even result in code loss.

What are the advantages & dis-advantages of Distributed Version Control System.

Advantages	Dis-Advantages
Because of local commits, the full history is always available.	It may not always be obvious who did the most recent changes
No need to access a remote server (faster access)	File locking doesn't allow different developers to work on the same piece of code simultaneously. It helps to avoid merge conflicts but slow down the development.
Ability to push your changes continuously	DVCS enables you to clone the clone the repository – this could mean a security issue.
Saves time, especially with SSH Keys	Managing non-mergeable files is contrary to the DVCS concept
Good for projects with offshore developers	Working with lot of binary files require huge amount of space, and developers can't do diffs.

Date: - 05/01/2023

Why .git is there inside the directory after initialization

A .git folder is required to log every commit history and every other information required for your remote repository, version control, commits etc.

These things are saved in different folders which have different meanings. Once the folder is created, open it and see the contents of folder.

Date: - 06/01/2023

What do you understand by image

An Amazon Machine Image (AMI) is supported and maintained image provided by AWS that provides the information required to launch an instance.

The information required to launch an instance is provided by the Amazon Machine Image. AMI must be specified when an instance is launched. One AMI can be chosen to launch multiple instances when the configuration required is the same for all the instances.

What do you understand by snapshot

A snapshot is a base feature for creating backups of your AMI's. A snapshot takes a copy of the AMI's and place it in Amazon S3, where it is stored redundantly in multiple Availability Zones. The initial snapshot is a full copy of the AMI.

What is the basic difference between snapshot and image

Snapshot	Image
A snapshot captures the state of a data store at a particular point in time.	An image stores a data store as a set of files.
They are helpful for taking a “snapshot” of a data store.	On the other hand, it is used to store data permanently.

Write the architecture of AMI

Steps to Create an Image in Amazon Machine Image. Here were creating a copy/snapshot of an AMI as per the requirement from team management or team manager.

There are couple of steps to create AMI Image

Step 1: Select your EC2 Instance

Step 2: Go to Actions

Step 3: Image & Templates

Step 4: Image Name

Step 5: Image Description

Step 6: Create Image

After, creating this image we can create as many instances as possible whenever it is required. Before creating instances from these images we have to also create snapshots for security purpose.