

Please do the following exercise. Should take few hours of your time:

Q-1: Which DevOps tools and databases have you worked on?

**Answer:**The Devops Tools that i have worked on as follows:

- AWS
- Jenkins
- Bitbucket

Databases that I have worked on are MYSQL 5.5 and MYSQL 5.7.

Q-2: I am not able to ssh to my ec2 instance, what could be the possible cause?

**Answer:**There are a number of reasons why we might have this issue.Some of it are as follows.

- Port 22 might be closed.
- User key not recognized by the server this might be due to usage of the wrong key.
- Host key not found, permission denied this might happen when the authorised\_keys does not have the public key in it or Permission of authorised\_keys might be 644 or some other permission instead of 600 and .ssh folder permission needs to be 700.
- Server refused our key or No supported authentication method available
- An unprotected private key file.The Pem key that we are using needs to be in 400 permission.

Q-3: Apache software needs to access the /var/log/application folder so that our application can write the log. How can we solve this problem?

**Answer:**To solve this problem,We need to create a folder in /var/log/ application and grant ownership of the Folder application as apache with the following command.

```
cd /var/log/httpd
```

```
cd /var/www/html
```

```
mkdir xyz
```

```
chown -R apache:apache application
```

If there is a website that is configured on the server.

Then we need to add Include /etc/httpd/conf/extra/httpd-vhosts.conf in /etc/httpd/conf/httpd.conf

Before restarting we need to create an extra folder and httpd-vhosts.conf in /etc/httpd.

In httpd-vhosts.conf

Need to add the following lines

```
<VirtualHost *:80>
```

```
    ServerAdmin admin@admin.com
```

```
    DocumentRoot /var/www/html/xyz
```

```
    ServerName xyz.com
```

```
    ServerAlias www.xyz,.com
```

```
    CustomLog "/var/log/application/access_log" common
```

```
    ErrorLog "/var/log/application/error_log"
```

```
</VirtualHost>
```

```
systemctl restart httpd.service
```

Now when we try to access the website log will be recorded in /var/log/application or according to the location mentioned in the config file.

Q-4: Change default login shell for all upcoming users on Linux?

**Answer:** To change the login shell for all upcoming users we need to do the following.

- We need to see the shell available in the server using

```
cat /etc/shells
```

- To check the shell used.

```
ps -p $$
```

```
PID TTY      TIME CMD
```

3358 pts/1 00:00:00 bash

- To change we need to add the shell in /etc/shells

Vi /etc/shells

/bin/csh

- To change the shell.

csh -s /bin/csh

- No we can check using

ps -s \$\$

Q-5: How to make a password less connection from server1 to server2?

**Answer:**

- After launching the second server we need to open SSH open port 22 to the Server ip in the security group.

EC2 > Security Groups > sg-0d36d8fae528032c2 - launch-wizard-1 > Edit inbound rules

Edit inbound rules [Info](#)

Inbound rules control the incoming traffic that's allowed to reach the instance.

Security group rule ID	Type	Protocol	Port range	Source	Description - optional	Info
sg-059976da47974f335	SSH	TCP	22	Custom	Q	<a href="#">Delete</a>
-	SSH	TCP	22	Custom	Q	<a href="#">Delete</a>

[Add rule](#)

[Cancel](#) [Preview changes](#) [Save rules](#)

- In the Server 1 generate ssh key as ec2 user without passphrase.

```

[ec2-user@ip-172-31-29-192 .ssh]$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ec2-user/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ec2-user/.ssh/id_rsa.
Your public key has been saved in /home/ec2-user/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:IkUq/bcdy36GoPM3G1HVwH7hjEE6GWXz5LgLa/oh13E ec2-user@ip-172-31-29-192.ap-
south-1.compute.internal
The key's randomart image is:
+---[RSA 2048]---+
  . . .o*o+ |
  . o      =oB..|
  . o .    +.o=o.|
  . o      ...oo.|
  . o S o. o E |
  . o.+ ++ + |
  ..o=* o |
  o .O.+ |
  o.o+* |
+-----[SHA256]-----+

```

- After generating, we need to copy the id\_rsa.pub in server 1 under /home/ec2-user to server 2 /home/ec2-user/.ssh/authorized\_keys.
- From server 1 we need to connect to server 2 using the following command

ssh ec2-user@server-2-ip

```

[ec2-user@ip-172-31-29-192 .ssh]$ ssh ec2-user@13.233.27.74
The authenticity of host '13.233.27.74 (13.233.27.74)' can't be established.
ECDSA key fingerprint is SHA256:98AxpM4nT8GnGCGb5YFh7p572H61NX1yQWZOYQVYlaw.
ECDSA key fingerprint is MD5:el:4f:6e:00:15:0b:ab:e3:a4:a0:36:67:77:1e:c5:40.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '13.233.27.74' (ECDSA) to the list of known hosts.
Last login: Mon Aug  9 15:31:17 2021 from 122.173.242.161

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  _ | \ _ | _ |

https://aws.amazon.com/amazon-linux-2/
4 package(s) needed for security, out of 16 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-29-200 ~]$ sudo su

```

We are on server 2 now.

Q-6: What is the difference between Hard and Soft Link and why do we create links?

Hard Link	Soft Link
Every File in the linux filesystem starts with a hard link. In other words.	Soft Link or Symbolic link are those where files after creation are linked to some other location mostly due to space reasons. These files are most likely linked in another volumes
Creating a file test in /home/ec2 with hello_world content and hard linking it to /tmp/test_link. File is available in both the locations	Creating a file name test_soft with contents 'this is a soft linked file' in /home/ec2-user and soft linking it to /mnt
Changes done in any of the locations will reflect in the file hardlinked in another location.	Changes can be done in one location only.
Hard Links can be used only in the same filesystem. When the hardlinked file and the original are in the same filesystem	SoftLinks can be used in multiple filesystem. The root drive here is in xfs file system and /mnt is in ext3
Command used is <code>ln [original file path] [new file path]</code>	Command used is <code>ln -s [file path we need to point] [new file path]</code>
Example: <code>ln test /tmp/link_test</code>	Example: <code>ln -s /mnt/test_soft /home/ec2-user</code>

Q-7: Monitor a file change using a shell script. If a file gets updated my script should give an output as "MODIFIED" in the terminal.

Answer:

Q-8: After reboot, I want to auto-mount my volumes in my ec2 instance, how to do that?

**Answer:** To automount volumes in ec2 instance after reboot. We need to add the disk details in Fstab according to the filesystem ,mount points

- `mkfs.ext3 /dev/xvdf`
- `mount /dev/xvdf ./mnt`
- `Vi /etc/fstab`

`/dev/xvdf`                      `/mnt`      `ext3`   `defaults`      `0`   `0`

- Mount -a

After reboot by checking with df -h

We can see the volumes to be automounted.

- df -h

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/xvda1	8.0G	1.7G	6.4G	21%	/
/dev/xvdf	7.8G	19M	7.4G	1%	/mnt

Q-9: I want to auto restart a service only if the service is stopped. If the service is running, the command / shell script should do nothing. How can we solve this problem?

**Answer:**

- Created a file services.sh in /home/ec2-user with the following commands.

```
#!/bin/bash
```

```
#Scripts to start services if not running
```

```
ps -ef | grep httpd | grep -v grep > /dev/null
```

```
if [ $? != 0 ]
```

```
then
```

```
systemctl start httpd > /dev/null
```

```
fi
```

- This will check whether the service is active if it is active it will exit if not the service will be started.

Q-10: I want to delete files in my Linux server which are more than 1GB. How to do this?

**Answer:** Here we are going to remove a mkv file that I moved manually from the local system to the server.

```
find -type f -name *mkv -size +1G -delete
```

```
[root@ip-172-31-29-192 ec2-user]# ll
total 1296372
drwxr-xr-x 6 root    root      199 Aug  5 07:52 aws-iot-device-sdk-python
-rw-rw-r-- 1 ec2-user ec2-user 3671 Aug  5 07:51 connect_device_package.zip
-rw-r--r-- 1 root    root     1224 Aug  5 07:51 EC2IOTask.cert.pem
-rw-r--r-- 1 root    root     1675 Aug  5 07:51 EC2IOTask.private.key
-rw-r--r-- 1 root    root      451 Aug  5 07:51 EC2IOTask.public.key
-rw-rw-r-- 1 ec2-user ec2-user 1327454818 Aug  8 06:51 movie.mkv
-rw-r--r-- 1 root    root     1188 Aug  5 07:52 root-CA.crt
-rw-rw-r-- 1 ec2-user ec2-user   48 Aug  9 11:44 sample.txt
-rwxr-xr-x 1 root    root     1170 Aug  5 07:51 start.sh
[root@ip-172-31-29-192 ec2-user]# find -type f -name *mkv -size +1G -delete
[root@ip-172-31-29-192 ec2-user]# ll
total 28
drwxr-xr-x 6 root    root      199 Aug  5 07:52 aws-iot-device-sdk-python
-rw-rw-r-- 1 ec2-user ec2-user 3671 Aug  5 07:51 connect_device_package.zip
-rw-r--r-- 1 root    root     1224 Aug  5 07:51 EC2IOTask.cert.pem
-rw-r--r-- 1 root    root     1675 Aug  5 07:51 EC2IOTask.private.key
-rw-r--r-- 1 root    root      451 Aug  5 07:51 EC2IOTask.public.key
-rw-r--r-- 1 root    root     1188 Aug  5 07:52 root-CA.crt
-rw-rw-r-- 1 ec2-user ec2-user   48 Aug  9 11:44 sample.txt
-rwxr-xr-x 1 root    root     1170 Aug  5 07:51 start.sh
```

Q-11: What will you check/do if A disk is 100% used?

**Answer:** To check if a disk is 100% used. We need to check using the below command.

- df -h
- To find which folder is occupying space

Cd /

Du -sh \* to find the folders space in /.

- According to the space we can either clear the files by using remove rm command or truncate command.

Rm filename or truncate filename --size 00 or truncate filename --size 100M

We can also increase the disk space without downtime if the application is not in production.

- First we need to increase the disk in AWS EC2 console with the modify volume option.

**Modify Volume**

Volume ID vol-077858a7aeef1ab77

Volume Type General Purpose SSD (gp2)

Size 16 (Min: 1 GiB, Max: 16384 GiB)

IOPS 100 / 3000 (Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS)

Cancel Modify

- In the Server Terminal We need to give the following commands

```
growpart /dev/xvda 1
```

```
sudo xfs_growfs -d /
```

- To check the space

```
df -h
```

```
Filesystem      Size  Used Avail Use% Mounted on
```

```
/dev/xvda1      16G  1.7G   15G  11% /
```

```
/dev/xvdf       7.8G  19M   7.4G   1% /mnt
```



Q-12: What's the difference between Continuous Delivery and Continuous Deployment?

**Answer:**

Continuous Delivery	Continuous Deployment
It is the process of automating the entire software release.	Continuous Deployment is the process in which each and every source code change is done directly in the production environment without developers approval.
It requires at least one step of manual approval	It requires high level of monitoring and being available on call. The changes done should not affect any features for the customers.

Q-13: What is Infrastructure as Code? Have you ever used it?

**Answer:**Infrastructure as code is the process of managing and provisioning computer data centers through machine-readable definition files. Some of the examples are as follows:

- Chef
- Puppet
- Ansible
- Terraform.

No, I have not used it before.

Q-14: How will you start troubleshooting if your website is down?

**Answer:**

- First thing to check is whether the httpd or apache is down using  
`systemctl status httpd` or `service apache2 status`
- Need to check the disk space of the Server using  
`df -h`

We need to clear unwanted space in the server and Restart httpd or apache2 once.

- Check whether the server contains the index file in `/var/www/html/projectname` such as `index.html` or `index.php`
- Check whether there is enough memory in the server using

free -m

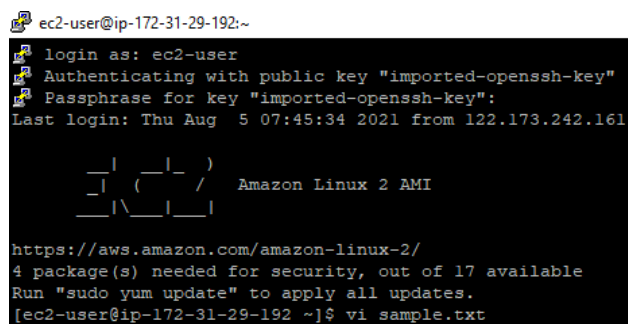
If not clear the cache memory using the following command

sync; echo 1 > /proc/sys/vm/drop\_caches and restart httpd or apache2 to refresh the httpd/apache2 services.

Q-15: How can I download a file from a linux server to my local machine?

**Answer:**

- Logging into the server using Putty and created a sample.txt file in /home/ec2-user.



```
ec2-user@ip-172-31-29-192:~  
login as: ec2-user  
Authenticating with public key "imported-openssh-key"  
Passphrase for key "imported-openssh-key":  
Last login: Thu Aug 5 07:45:34 2021 from 122.173.242.161  
  
  _ | _ | _ )  
  _ | ( _ | /  Amazon Linux 2 AMI  
  _ | \ _ | _ |  
  
https://aws.amazon.com/amazon-linux-2/  
4 package(s) needed for security, out of 17 available  
Run "sudo yum update" to apply all updates.  
[ec2-user@ip-172-31-29-192 ~]$ vi sample.txt
```

login as: ec2-user

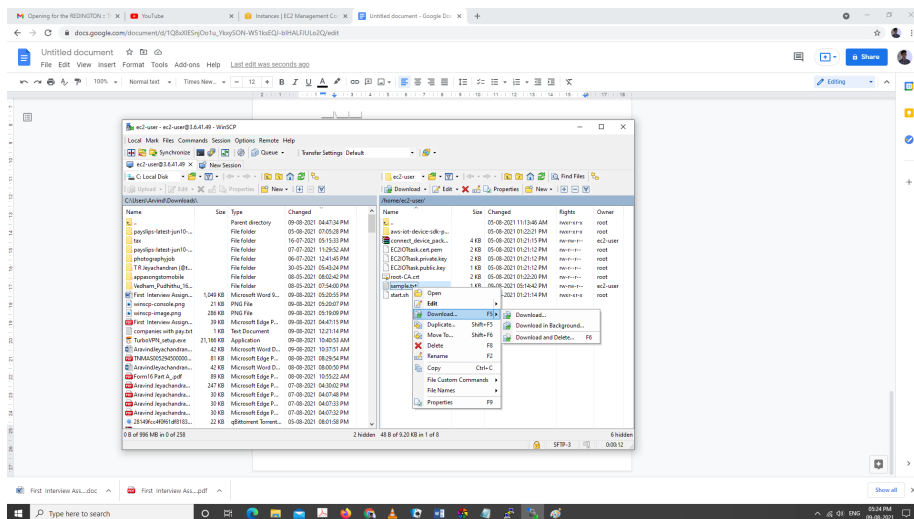
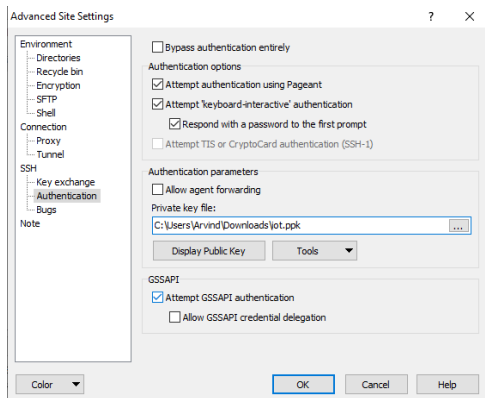
Authenticating with public key "imported-openssh-key"

Passphrase for key "imported-openssh-key":

Last login: Thu Aug 5 07:45:34 2021 from 122.173.242.161

[ec2-user@ip-172-31-29-192 ~]\$ vi sample.txt

- Logging into the server using winscp to download the file from the server.



- Select the file that needs to be downloaded and select download. That file can be viewed.

