Experiment No. 6

Aim: To study and Implement Storage as a Service using Own Cloud/ AWS S3, Glaciers/ Azure Storage.

Requirements: Windows/Mac/Linux O.S and AWS/Azure account.

Theory:

What Is Storage as a Service?

Storage as a service (STaaS) is a data storage business model where a provider rents storage resources to a customer through a subscription. STaaS saves you money through operating expenditure (OpEx) agility—you only pay for the storage you need, when you need it.

Why Use Storage as a Service?

Buying new storage capacity can be an expensive capital expenditure (CapEx), especially if you aren't sure how much capacity you'll need in the future. You can try to predict the growth of your business and purchase with the future in mind, but it can tie up financial resources that might have more impact elsewhere in your business.

Fortunately, there's no shortage of major tech companies with large data centers that are willing to sell their excess capacity. For these businesses, storage is just another service that's part of their expansive product offerings, and they're more than happy to absorb the expenses of managing, upgrading, and maintaining large-scale storage area networks (SANs). Amazon Web Services (AWS), Microsoft Azure, Google Cloud, and Oracle Cloud are all examples of major cloud storage providers with STaaS subscription options.

STaaS lets you treat storage as OpEx. You sign a service level agreement (SLA) with your STaaS provider and pay for storage and data transfer rates (e.g., cost per gigabyte). Best of all,

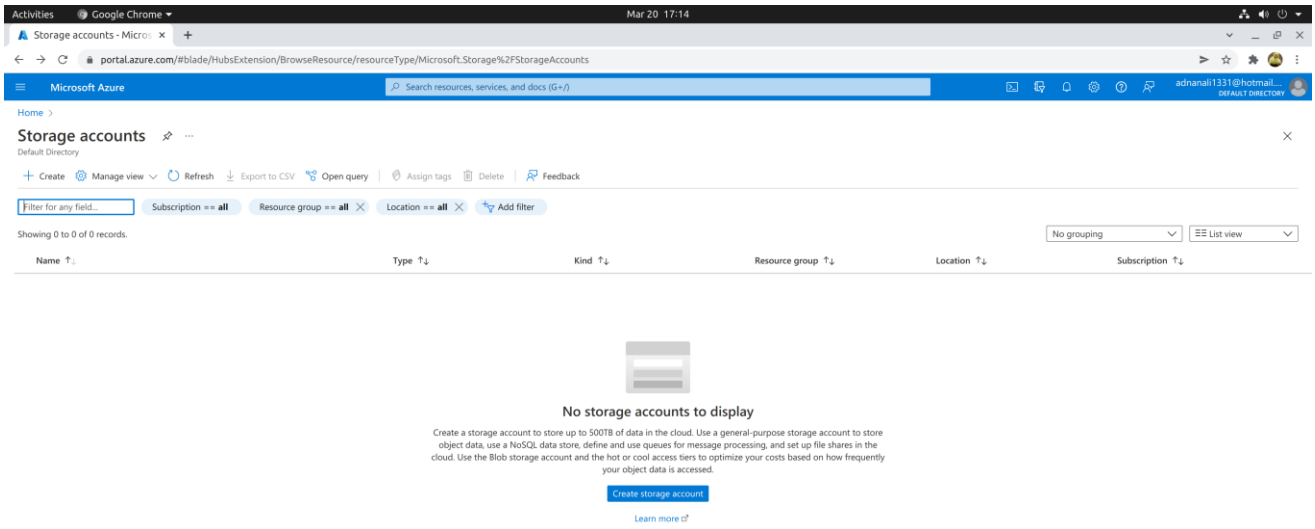
this whole process is automated, allowing you to scale your storage needs up and down as demand requires while maintaining performance and availability 24/7.

Benefits of Storage as a Service

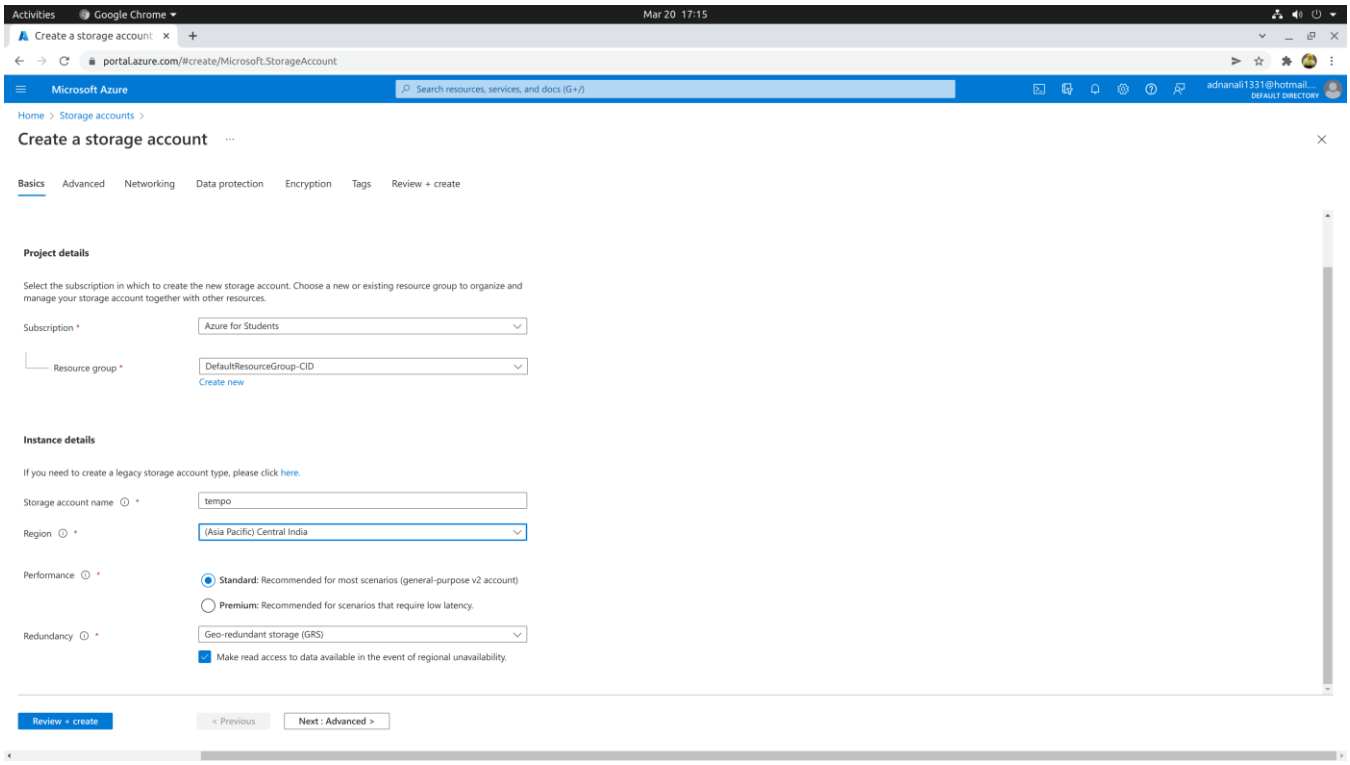
- OpEx subscription model that lets you optimize your storage costs
- Ability to quickly scale and provision storage resources to your apps as you grow
- Always-on reliability of major cloud service providers
- Simplified storage management environment

Implementation:

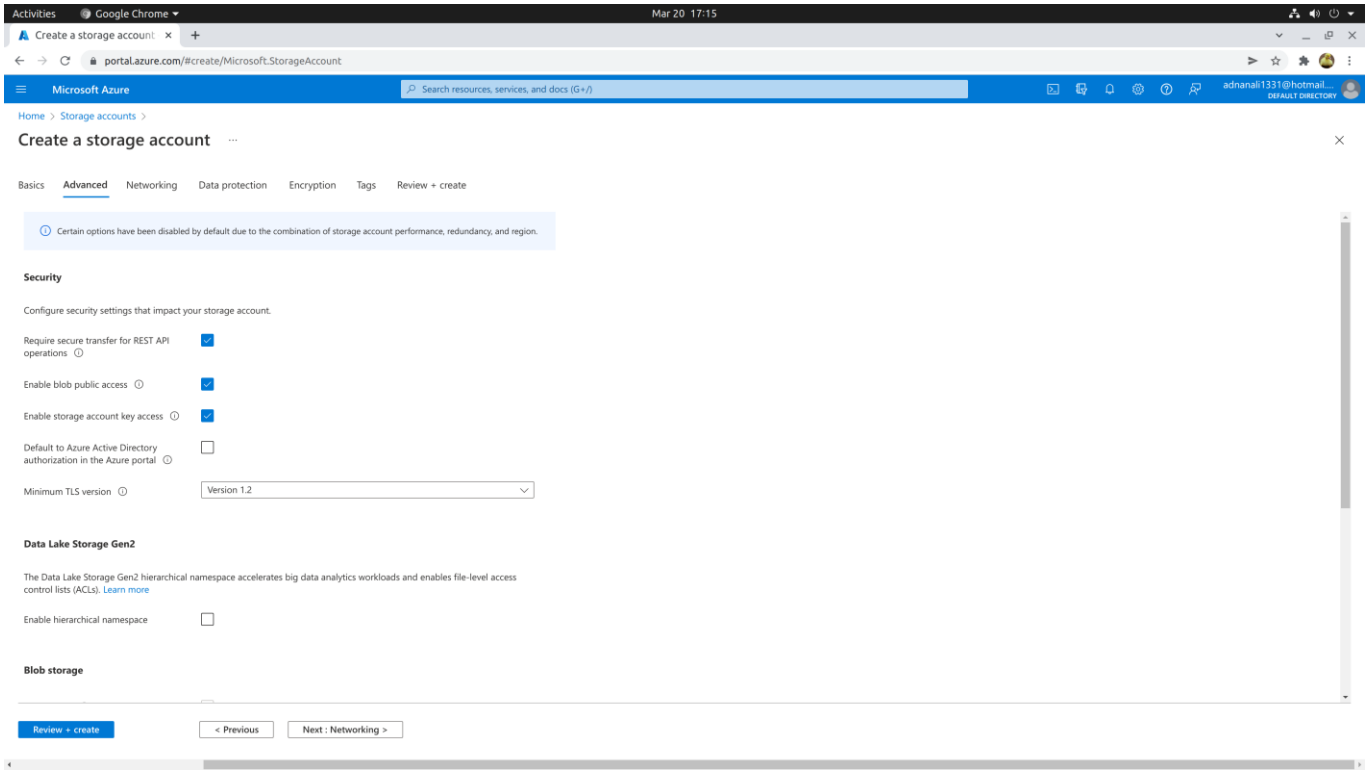
1) Creating Storage Account



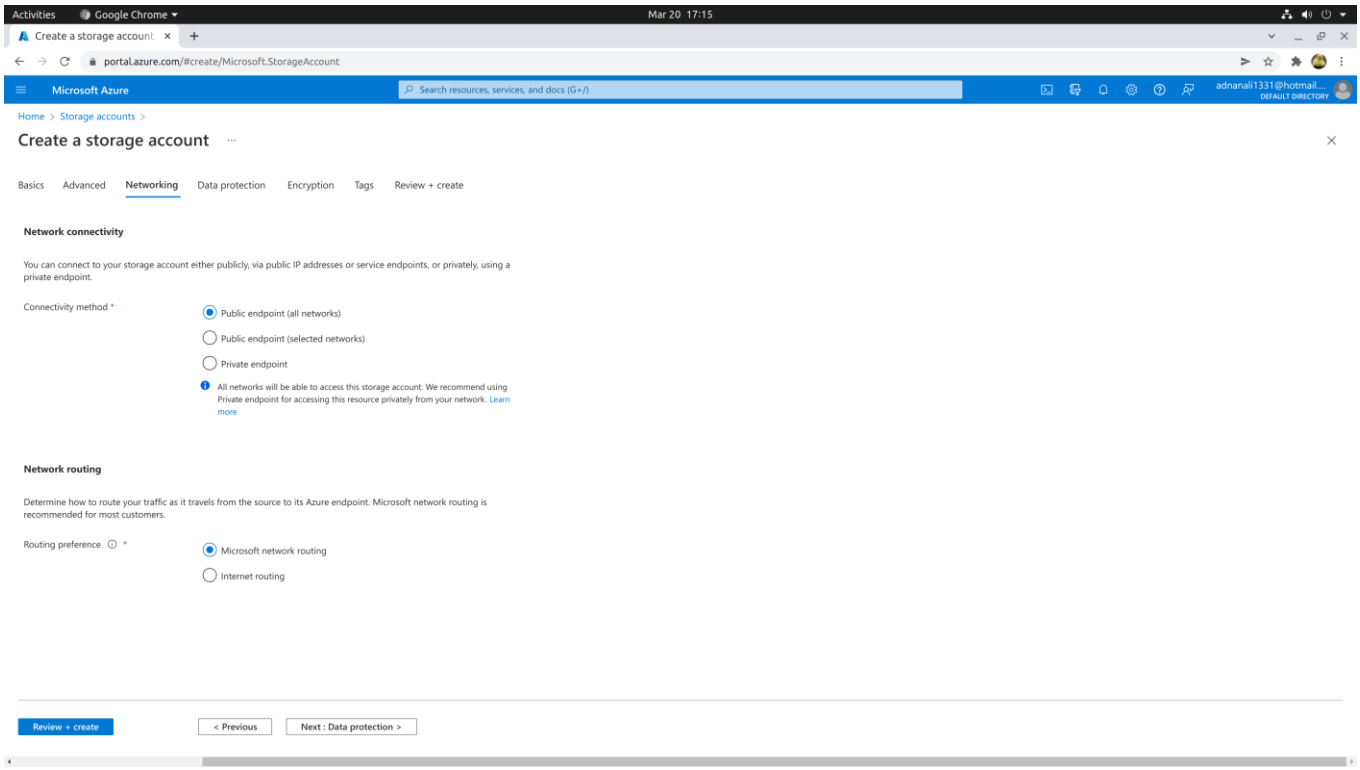
a) Basics



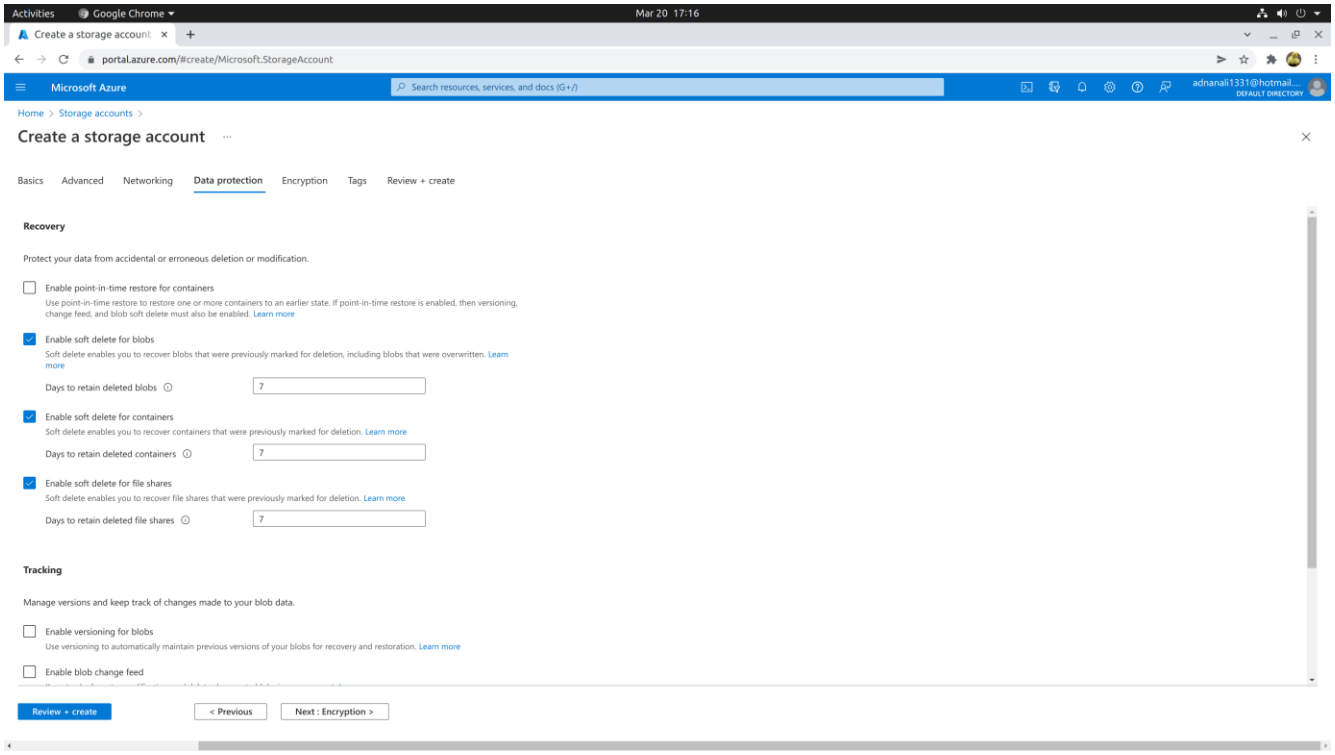
b) Advance



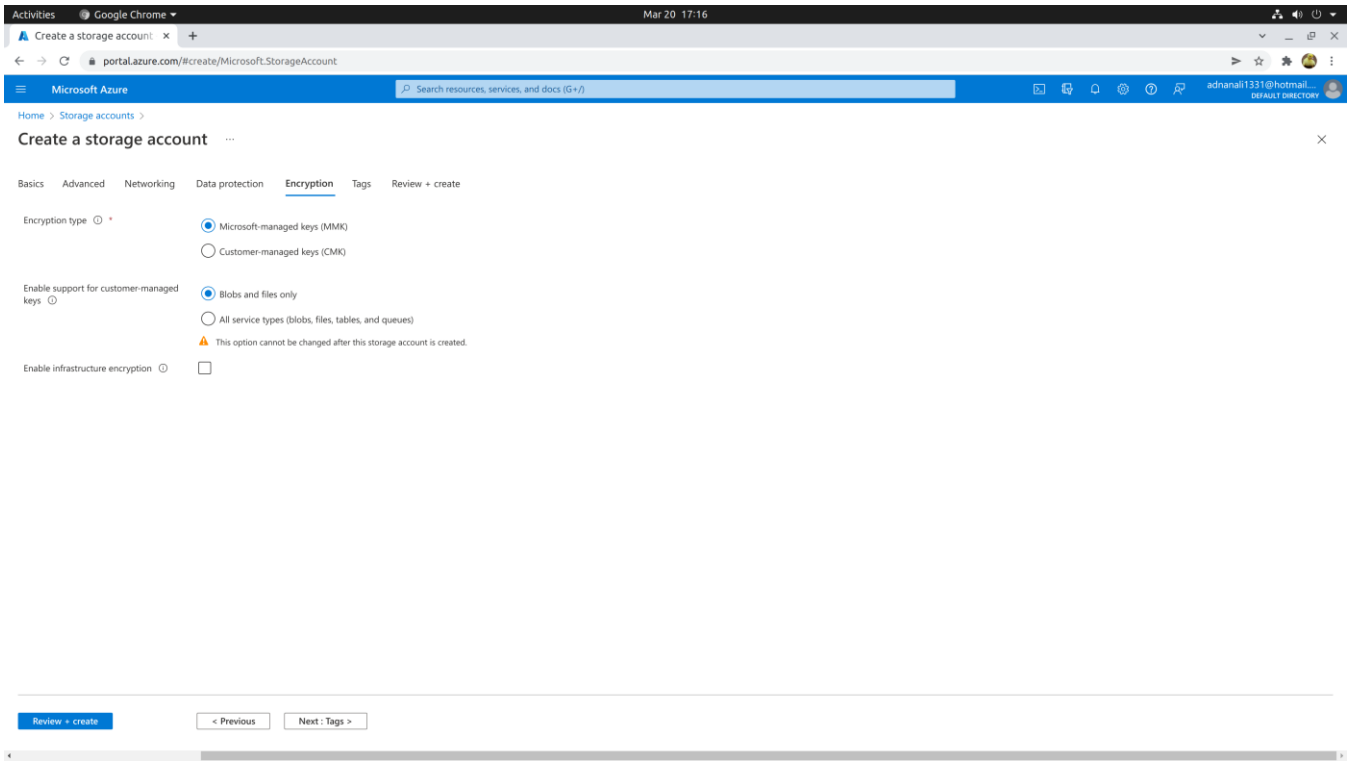
c) Network



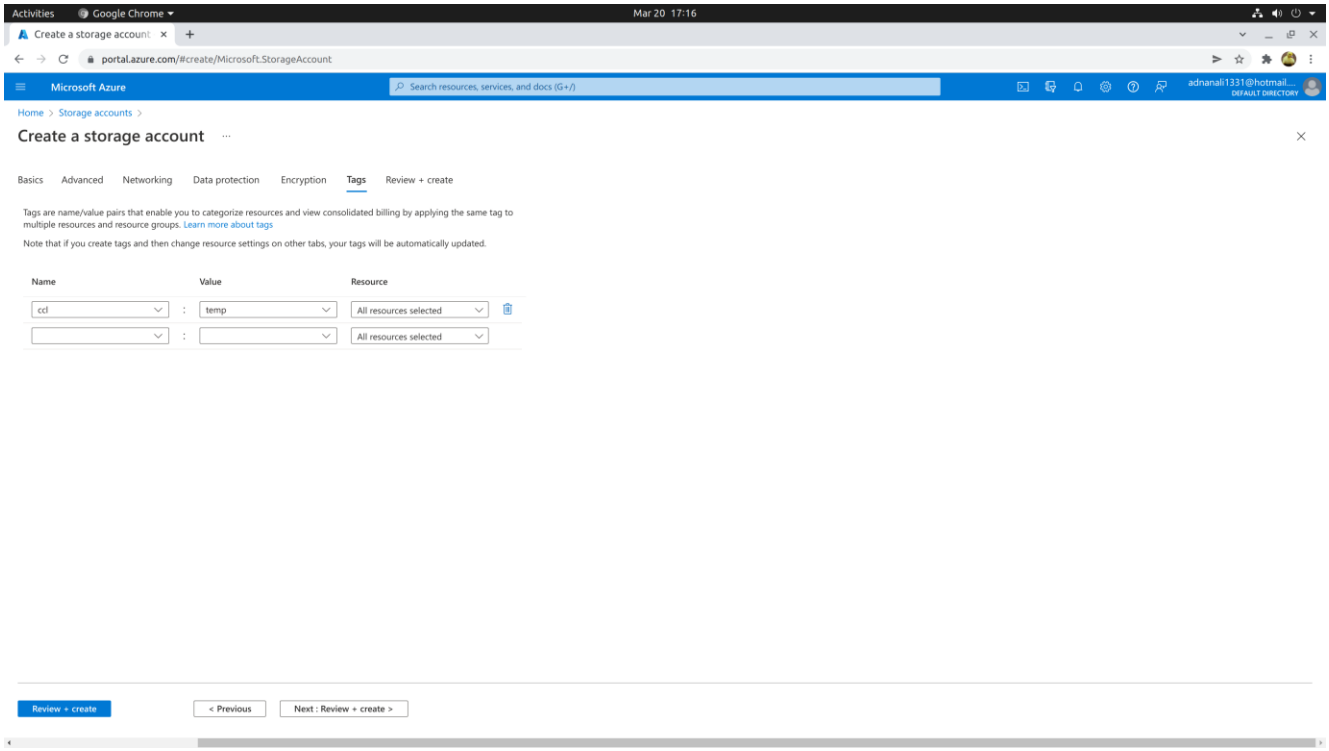
d) Protection



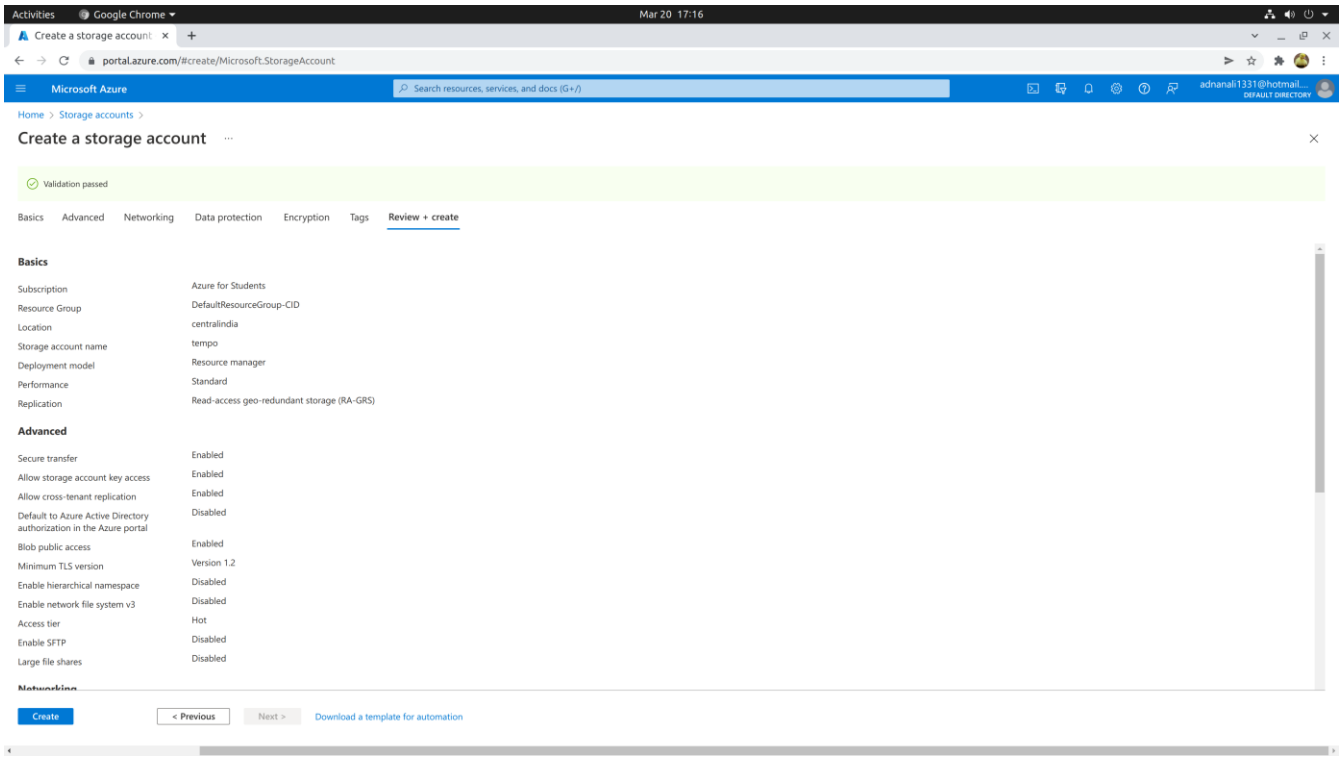
e) Encryption



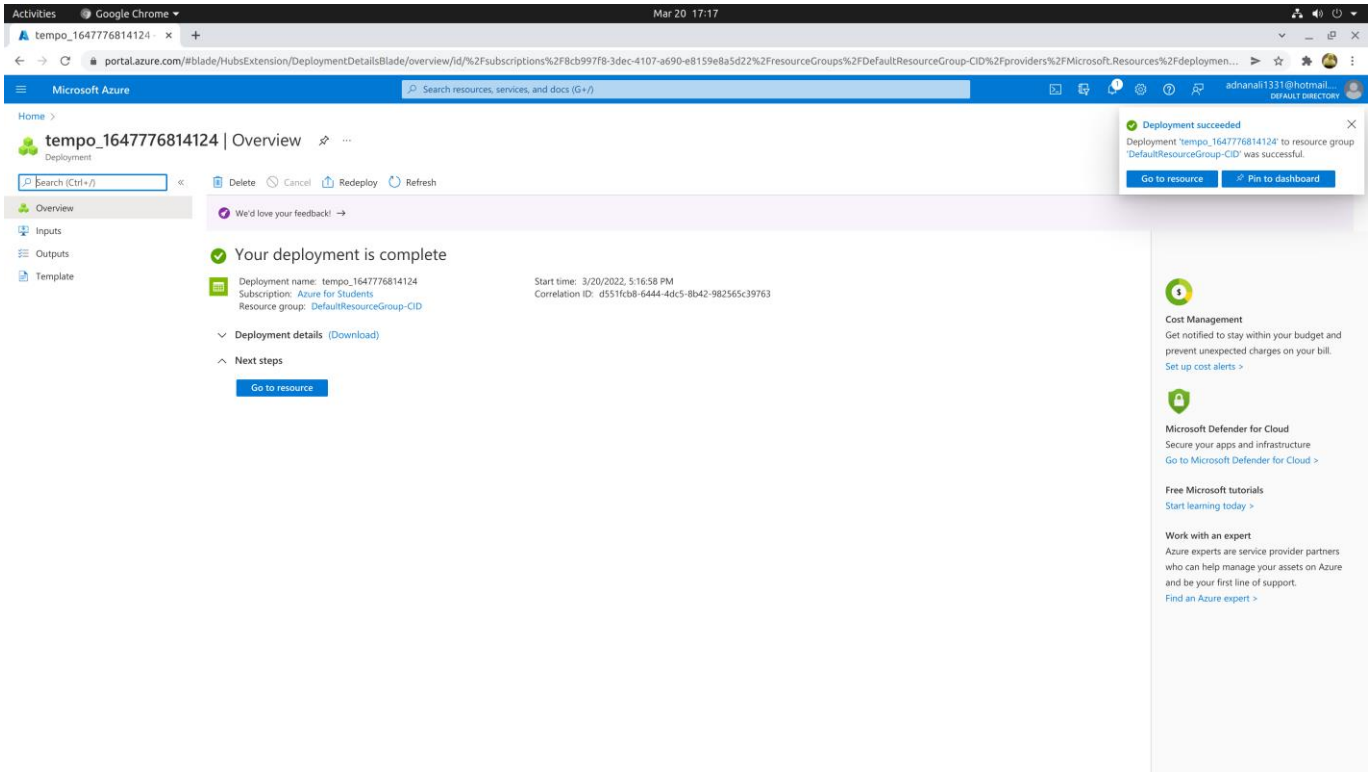
d) Tags



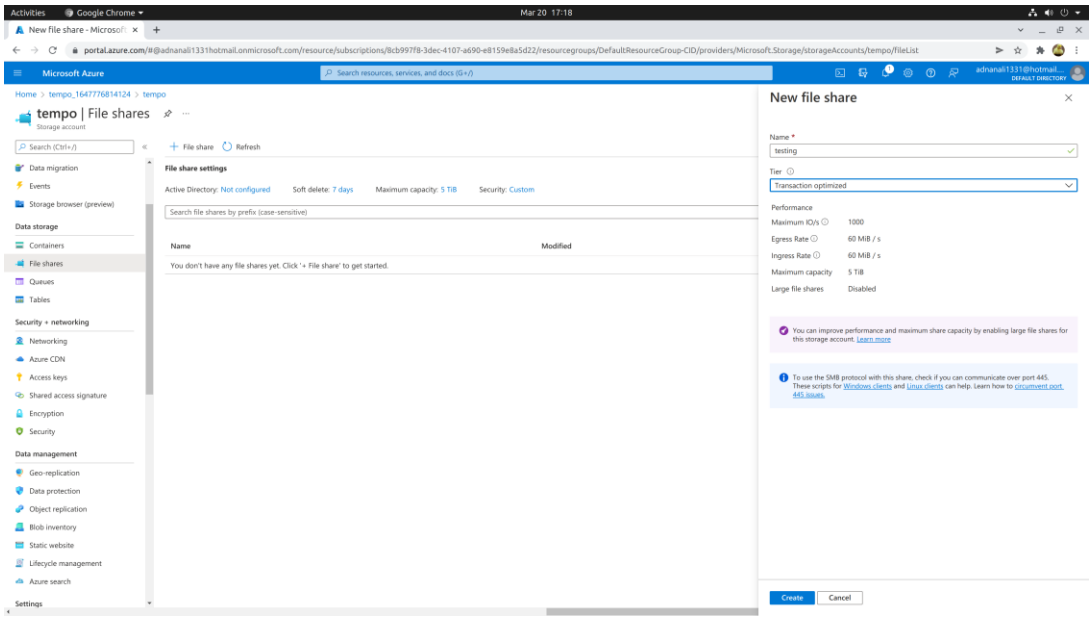
e) Reviewing and creating



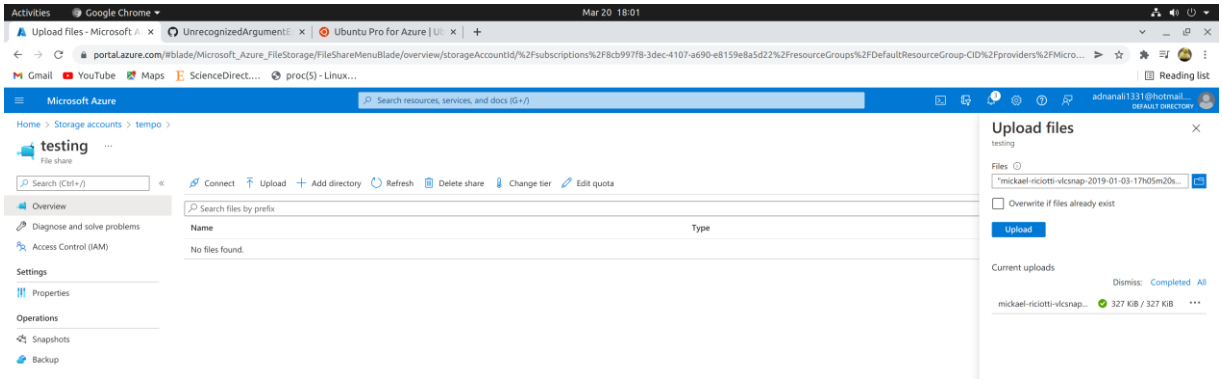
d) Successful deployment



2) Creating Share File storage



3) Uploading file



4) Creating Linux VM to access this File shares

```
adnan@Azure:~$ group=azure-files-temp
adnan@Azure:~$ name=linux-vm
```

```
adnan@Azure:~$ az vm create\
>  --name $name\
>  --resource-group $group\
>  --image UbuntuLTS\
>  --generate-ssh-keys\
>  --admin-username adnan
SSH key files '/home/adnan/.ssh/id_rsa' and '/home/adnan/.ssh/id_rsa.pub' have been generated under ~/.ssh to allow SSH access to the VM. If using m
 to a safe location.
It is recommended to use parameter "--public-ip-sku Standard" to create new VM with Standard public IP. Please note that the default public IP used
rd in the future.
{
  "fqdns": "",
  "id": "/subscriptions/8cb997f8-3dec-4107-a690-e8159e8a5d22/resourceGroups/azure-files-temp/providers/Microsoft.Compute/virtualMachines/linux-vm",
  "location": "centralindia",
  "macAddress": "60-45-BD-AD-0C-53",
  "powerState": "VM running",
  "privateIpAddress": "10.0.0.4",
  "publicIpAddress": "20.193.242.50",
  "resourceGroup": "azure-files-temp",
  "zones": ""
}
```

Terminal container button

5) Accessing storage account through SSH

```
adnan@Azure:~$ az vm show  -g $group  -n $name  -d  --query "{name:name,publicIps:publicIps,user:osProfile.adminUsername}"  -o jsonc > clouddrive/$name.json
adnan@Azure:~$ cat clouddrive/$name.json
'{
  "name": "linux-vm",
  "publicIps": "20.193.242.50",
  "user": "adnan"
}
adnan@Azure:~$ ssh adnan@20.193.242.50
The authenticity of host '20.193.242.50 (20.193.242.50)' can't be established.
ECDSA key fingerprint is SHA256:WK8ibA5raWQc3uF9nZQey6tS78EvA+ma4ByQ+y1Umog.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '20.193.242.50' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1072-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Sun Mar 20 12:29:05 UTC 2022

  System load:  0.0               Processes:           108
  Usage of /:   4.8% of 28.90GB   Users logged in:     0
  Memory usage: 5%                IP address for eth0: 10.0.0.4
  Swap usage:   0%

0 updates can be applied immediately.



The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

adnan@linux-vm:~$
```

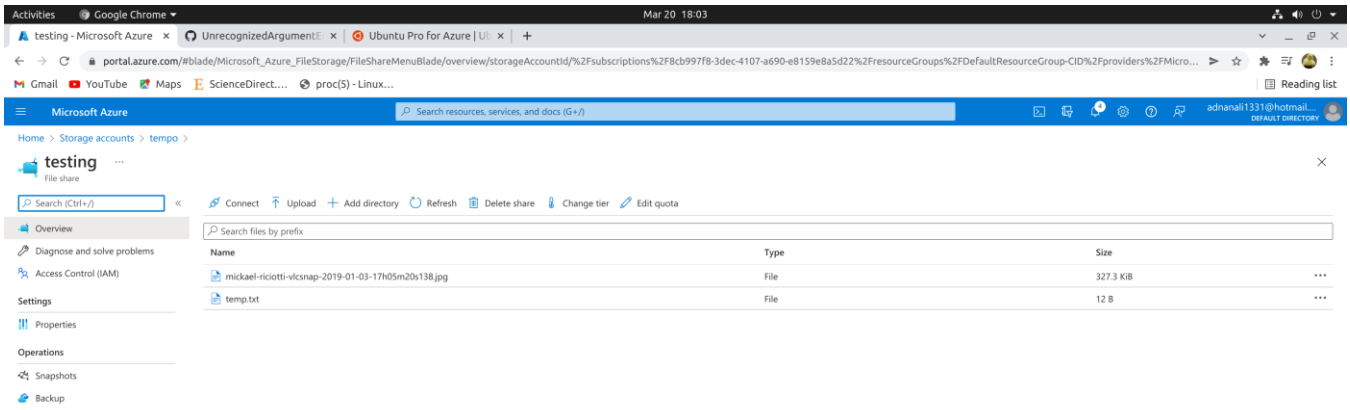
6) Connecting VM to File Share storage:

```
adnan@linux-vm:~$ sudo mkdir /mnt/testing
adnan@linux-vm:~$ if [ ! -d "/etc/smbcredentials" ]; then
> sudo mkdir /etc/smbcredentials
> fi
adnan@linux-vm:~$ if [ ! -f "/etc/smbcredentials/tempo.cred" ]; then
>     sudo bash -c 'echo "username=tempo" >> /etc/smbcredentials/tempo.cred'
>     sudo bash -c 'echo "password=d3TC0pwzeOTqhQHr1GsFYmgfEOtRkDBUYUE/Osn5q9rYnbgbb9seduIq/5Q+AYtcYIEPN18g+DAxMosnZadihg==" >> /etc/smbcredentials/tempo.cred
> fi
adnan@linux-vm:~$ sudo chmod 600 /etc/smbcredentials/tempo.cred
adnan@linux-vm:~$
adnan@linux-vm:~$ sudo bash -c 'echo "//tempo.file.core.windows.net/testing /mnt/testing cifs nofail,vers=3.0,credentials=/etc/smbcredentials/tempo.cred,dir_m
/fstab'
adnan@linux-vm:~$ sudo mount -t cifs //tempo.file.core.windows.net/testing /mnt/testing -o vers=3.0,credentials=/etc/smbcredentials/tempo.cred,dir_mode=0777,f
adnan@linux-vm:~$ ls /mnt/
DATALOSS_WARNING_README.txt  lost+found  testing
```

7) Reading and writing files to File Share storage

```
adnan@linux-vm:~$ ls /mnt/testing/
mickael-riciotti-vlcsnap-2019-01-03-17h05m20s138.jpg
adnan@linux-vm:~$ echo "hello world" > /mnt/testing/temp.txt
adnan@linux-vm:~$
```

8) Result



Conclusion: We have successfully implemented Storage as a Service using Azure.