Koganti Divya

1. EC2 Instances

Steps:

- 1. Open AWS and under search box select EC2
- 2. Click on launch instance
- 3. Now enter name of your machine (Machine1-Divya)
- 4. Under AMI select Amazon Linux
- 5. under instance type select t2.micro
- 6. Under key pair >> create a new key pair (sydney.pem)
- 7. Under firewall security group click on create security group
- 8. And click on launch instance
- 9. Repeat the same process and create one more instance (Machine2-Koganti)

aws III Services	Q Search			[Alt+S]					D.	\$ Ø	Sydney 🔻	Divya Koganti 🔻
Instances	În	stances (2) Info			[C	Connect Instance stat	e 🔻 🗌	Action	s 🔻 🛛 La	unch instar	nces 🔻
Instances New	C	Find instance by attribut	ite or tag (case-sensitive)								<	1 > @
Instance Types												
Launch Templates		Name 🗢	Instance ID	Instance stat	e ⊽ Inst	ance type		Alarm sta	tus	Availability	Zone ⊽	Public IPv4 DN
Spot Requests		Machine1-Divya	i-03c3a48e9eb421a0d	⊘ Running	@Q t2.n	nicro	⊘ 2/2 checks passed	No alarms	+	ap-southeas	st-2b	ec2-13-239-8-1
Savings Plans		Machine2-Koganti	i-0924b19419ac0b6e1	⊘ Running	@	nicro	⊘ 2/2 checks passed	No alarms	+	ap-southeas	st-2b	ec2-3-26-187-1
Reserved Instances New	4											•
Dedicated Liests												

Fig1:Ec2 instances

- 10. Steps to connect to ec2 machines.
 - Select machine1 under instances tab and click on connect.
 - Under connect to instance select SSH client
 - Now copy the ssh command shown under example
 - Now go to the .pem file location directory and open command prompt terminal
 - Now paste the ssh command and click on enter
 - Type yes to connect and you can see your Machine1-Divya instance running

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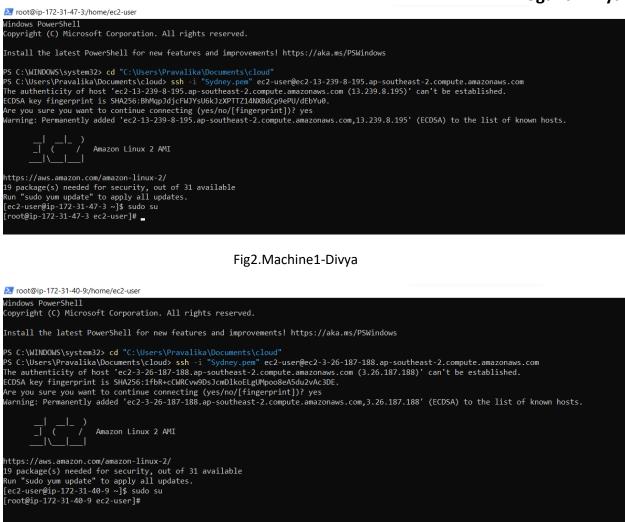


Fig3.Machine2-Koganti

2. EBS volume

Steps:

1. When Ever you want to provide an extra storage to your machine you opt for this Elastic Block store (EBS).

2. Created Two machines Divya-Machine A and Divya-Machine B in Tokyo region.

aws Services	Q Search	[Alt+S]	ג 👌 🕜 Tokyo ד Divya Koganti ד
▼ Instances	Instances (2) Info	C Connect Instance state ▼	Actions v Launch instances
Instances New	Q. Find instance by attribute or tag (case-sensitive)		< 1 > @
Instance Types	Name ▼ Instance ID	Instance state 🗢 Instance type 🗢 Status check Alarm sta	atus Availability Zone 🔻 Public IPv4 DNS
Launch Templates	Divya-MachineB i-06bf273785cd3daa6	⊘ Running @ Q t2.micro ④ Initializing No alarm	s + ap-northeast-1a ec2-54-199-67-1
Spot Requests Savings Plans	Divya-MachineA i-0bdfc3f47d819e8c6	⊘ Running Q t2.micro ② Initializing No alarma	s + ap-northeast-1a ec2-54-249-196-
Reserved Instances New	<u> </u>		

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Fig4: Instances for EBS

3.Under EBS select volumes and you can see default storage allocated for your EC2 machines.

4.Now click on create volume

- Under volume type select any type you want (General purpose SSD (gp2))
- Under size select the amount of GB (1GB)
- Under Availability zone you can select available zone in which your instance got created.
- Now click on create volume.
- Now click on volumes and you can see all volumes and newly created EBS.
- Now select the EBS and click on actions and click on attach volume.
- Under Basic details select your instance and click on attach volume

aws Services Q Sea	rch	[Alt+S]	۵. ا	🗘 🕜 Tokyo 🔻 Divya Koganti 🔻
▼ Images	Successfully created volume vol-0e2f4d6f17c68c5d6.			×
AMIs	Volumes (3)		C	Actions Create volume
AMI Catalog	Q Search			< 1 > 💿
▼ Elastic Block Store	□ Name ▼ Volume ID ▼	Type 🔻 Size 🔻 IOPS	▼ Throughput ▼ Snapshot ▼	Created V Availat
Volumes	- vol-068ce6dd4921478ee	gp2 8 GiB 100	- snap-07d1fa1	2022/12/10 21:44 GMT+5: ap-nort
Snapshots	- vol-00c984d5ae2010bd3	gp2 8 GiB 100	- snap-07d1fa1	2022/12/10 21:45 GMT+5: ap-nort
Lifecycle Manager	Divya-EBS vol-0e2f4d6f17c68c5d6	gp2 1 GiB 100		2022/12/10 21:48 GMT+5: ap-nort
Network & Security	<u>(</u>			•

Fig5: EBS volume of 1GB

6.Now log on to Divya-MachineA and make a file system and mount it.

- lsblk to list all file systems
- mkdir to create a storage directory
- mkfs -t xfs /dev/sdf
- mount -t xfs /dev/sdf storage
- created a storage directory named Divya-Storage
- mounted it to file system and created ten .txt files in it
- umounted the file system.

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≥ root@ip-172-31-32-56:~	
Windows PowerShell Copyright (C) Microsoft Corporation. All rights reserved.	
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows	
PS C:\WINDOWS\system32> cd "C:\Users\Pravalika\Documents\Cloud2" PS C:\Users\Pravalika\Documents\Cloud2> ssh -i "Tokyo.pem" ec2-user@ec2-54-249-196-242.ap-northeast-1.comp Last login: Sat Dec 10 16:21:25 2022 from 157.48.160.173	pute.amazonaws.com
_) _ (/ Amazon Linux 2 AMI \	
https://aws.amazon.com/amazon-linux-2/	
19 package(s) needed for security, out of 31 available	
Run "sudo yum update" to apply all updates.	
[ec2-user@ip-172-31-32-56 ~]\$ sudo su	
[root@ip-172-31-32-56 ec2-user] lsblk	
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT xvda 202:0 0 8G 0 disk	
$L_{xvda1} 202:0 0 8G 0 part /$	
xvdf 202:80 0 1G 0 disk	
[root@ip-172-31-32-56 ec2-user]# df -hT	
Filesystem Type Size Used Avail Use% Mounted on	
devtmpfs devtmpfs 474M 0 474M 0%/dev	
tmpfs tmpfs 483M 0 483M 0%/dev/shm	
tmpfs tmpfs 483M 412K 483M 1% /run	
tmpfs tmpfs 483M 0 483M 0%/sys/fs/cgroup	
/dev/xvda1 xfs 8.0G 1.6G 6.5G 20% / tmpfs tmpfs 97M 0 97M 0%/run/user/1000	
tmpfs tmpfs 97M 0 97M 0%/run/user/1000 [root@ip-172-31-32-56 ec2-user]# mkdir divya-Storage	
[rootel] 1/2-31-32-56 ec2-user] # Is	
diva-Storage	
[root@ip-172-31-32-56 ec2-user]# mkfs -t xfs /dev/xvdf	
<pre>meta-data=/dev/xvdf isize=512 agcount=4, agsize=65536 blks</pre>	
= sectsz=512 attr=2, projid32bit=1	
= crc=1 finobt=1, sparse=0	
data = bsize=4096 blocks=26214, imaxpct=25	
= sunit=0 suidt=0 blks	
naming =version 2 bsize=4096 ascii-ci=0 ftype=1 log =internal log bsize=4096 blocks=2560, version=2	
= sectsz=512 sunit=0 blss, lazy-count=1	
realtime =none extsz=4966 blocks=0, rtextents=0	
[root@ip-172-31-32-56 ec2-user]# mount -t xfs /dev/xvdf /home/ec2-user/divya-Storage	

Fig 6: File system created for Divya-MachineA and mounted it

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Icot@ip-172-31-32-56:~ [root@ip-172-31-32-56 ec2-user]# mount -t xfs /dev/xvdf /home/ec2-user/divya-Storage [root@ip-172-31-32-56 ec2-user]# df -hT Size Used Avail Use% Mounted on Filesystem Type devtmpfs 474M devtmpfs 0% /dev 0 474M tmpfs tmpfs 483M 0 483M 0% /dev/shm 483M 412K 483M tmpfs 1% /run tmpfs 0% /sys/fs/cgroup tmpfs tmpfs 483M 0 483M /dev/xvda1 xfs 8.0G 1.6G 6.5G 20% / 0% /run/user/1000 tmpfs tmpfs 97M 97M /dev/xvdf xfs 1014M 34M 981M 4% /home/ec2-user/divya-Storage [root@ip-172-31-32-56 ec2-user]# pwd /home/ec2-user [root@ip-172-31-32-56 ec2-user]# ls root@ip-172-31-32-56 ec2-user]# cd divya-Storage/ [root@ip-172-31-32-56 divya-Storage]# touch {1..10}.txt [root@ip-172-31-32-56 divya-Storage]# ls 10.txt 1.txt 2.txt 3.txt 4.txt 5.txt 6.txt 7.txt 8.txt 9.txt [root@ip-172-31-32-56 divya-Storage]# umount -t xfs /dev/xvdf /home/ec2-user/divya-Storage/ umount: /home/ec2-user/divya-Storage: target is busy. umount: /home/ec2-user/divya-Storage/: target is busy. [root@ip-172-31-32-56 divya-Storage]# cd --[root@ip-172-31-32-56 ~]# umount -t xfs /dev/xvdf /home/ec2-user/duivya-Storage umount: /home/ec2-user/duivya-Storage: no mount point specified. [root@ip-172-31-32-56 ~]# df -hT Filesystem Туре Size Used Avail Use% Mounted on devtmpfs devtmpfs 474M 0 474M 0% /dev tmpfs 483M 0 483M 0% /dev/shm tmpfs tmpfs 483M 412K 483M 1% /run tmpfs tmpfs tmpfs 483M 0 483M 0% /sys/fs/cgroup 8.0G 1.6G 6.5G 20% / /dev/xvda1 xfs 97M 0% /run/user/1000 tmpfs tmpfs 97M 0 [root@ip-172-31-32-56 ~]# cat

Fig7: Created 10 files in divya-Storage and unmounted it

7. Now detach the EBS volume from machine A and attach it to Machine B

8. Now connect to Machine B, create a new directory and mount the same to it.

9. Divya-MachineB EBS volume contains all the ten txt files

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root@ip-172-31-37-168:/home/ec2-user/divya-Attach

```
__| __|_
__| ( ____
___|\___|__
```

Amazon Linux 2 AMI

```
https://aws.amazon.com/amazon-linux-2/
19 package(s) needed for security, out of 31 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-37-168 ~]$ sudo su
[root@ip-172-31-37-168 ec2-user]# lsblk
NAME
       MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda
       202:0
                0
                    8G 0 disk
                    8G 0 part /
└─xvda1 202:1
                0
xvdf
       202:80 0
                    1G 0 disk
[root@ip-172-31-37-168 ec2-user]# df -hT
                        Size Used Avail Use% Mounted on
Filesystem
              Туре
              devtmpfs 474M
devtmpfs
                                 0 474M
                                           0% /dev
tmpfs
              tmpfs
                        483M
                                 0 483M
                                           0% /dev/shm
tmpfs
              tmpfs
                        483M 412K 483M 1% /run
                                 0 483M
tmpfs
              tmpfs
                        483M
                                           0% /sys/fs/cgroup
/dev/xvda1
              xfs
                        8.0G 1.6G 6.5G 20% /
tmpfs
                        97M
                                    97M
                                           0% /run/user/1000
              tmpfs
                                 0
[root@ip-172-31-37-168 ec2-user]# ls
[root@ip-172-31-37-168 ec2-user]# fdisk -1
Disk /dev/xvda: 8 GiB, 8589934592 bytes, 16777216 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: DA90AB95-8C11-4BAE-9157-C48213FBAD0C
                       End Sectors Size Type
Device
            Start
                                      8G Linux filesystem
/dev/xvda1
             4096 16777182 16773087
/dev/xvda128 2048
                      4095
                               2048
                                      1M BIOS boot
Partition table entries are not in disk order.
Disk /dev/xvdf: 1 GiB, 1073741824 bytes, 2097152 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
[root@ip-172-31-37-168 ec2-user]# mkdir divya-Attach
[root@ip-172-31-37-168 ec2-user]# mount -t xfs /dev/xvdf /home/ec2-user/divya-Attach/
[root@ip-172-31-37-168 ec2-user]# cd divya/Attach/
bash: cd: divya/Attach/: No such file or directory
[root@ip-172-31-37-168 ec2-user]# cd divya-Attach/
[root@ip-172-31-37-168 divya-Attach]# ls
10.txt 1.txt 2.txt 3.txt 4.txt 5.txt 6.txt 7.txt 8.txt 9.txt
[root@ip-172-31-37-168 divya-Attach]# cat
```

Fig8: Divya-MachineB EBS

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3. Snapshot

Steps:

- 1. Under EC2 Elastic Block store click on Snapshot
- 2. Click on create snapshot
- 3. Under volume id select your volume (Divya-EBS) in Tokyo region
- 4. Under description enter name of snapshot
- 5. Now click on create snapshot
- 6. Now click on snapshots and you can able to see your created snapshot
- 7. Select your snapshot and click on actions and click on copy snapshot

8. In settings page of copy snapshot under Destination region select the region where you want to create sydney (ap-northeast1)

9. Now click on copy snapshot

aws Services Q Sea	rch [Alt+S]	ג 🎸 🕜 Tokyo ▼ Divya Koganti ▼
▼ Images	Snapshots (1)	C I Recycle Bin Actions ▼ Create snapshot
AMIs	Owned by me 💌 🔍 Search	< 1 > ©
AMI Catalog	□ Name ▼ Snapshot ID ▼ Size ▼ Description	▼ Storage ▼ Snapshot status ▼ Started ▼ F
Elastic Block Store	Divya-Snapshot snap-Ofb156838eaf4fa92 1 GiB Divya-Snapshot	Standard O Completed 2022/12/10 22:14 GMT+5: (
Volumes	<u>(</u>	• • • • • • • • • • • • • • • • • • •

Fig 9: Snapshot created in Tokyo region from Divya-EBS volume

aws iii Services Q Search	'n	[Alt+S]					D \$ 0	Sydney 🔻 Divya Koganti 🔻
New EC2 Experience X	⊘ Successfully attached vo	lume <u>vol-035d226ea37b164b6</u> to instance	e i-00af82cce81a	caf9d.				×
Tell us what you think	Volumes (4)						C Actions	Create volume
EC2 Dashboard	Q, Search							< 1 > @
EC2 Global View	Name	Volume ID 5	7 Type ⊽	Size	▼ IOPS	▼ Throughput	▼ Snapshot ▼	Created
Events Tags	-	vol-0c4e9ab13147ceffa	gp2	8 GiB	100	-	snap-0f90481	2022/12/10 21:23 GMT+5
Limits		vol-096faafddac8b96f7	gp2	8 GiB	100	-	snap-0f90481	2022/12/10 21:29 GMT+5
		vol-04d04f1517caac5ce	gp2	8 GiB	100	-	snap-0f90481	2022/12/10 22:19 GMT+5
Instances	Divya-SnapshotCo	vol-035d226ea37b164b6	gp2	1 GiB	100	-	snap-006164c	2022/12/10 22:26 GMT+5
Instances New	4							

Fig 10: volume created from copy snapshot in Sydney region

10. Create a Divya-Machine C in sydney region and attach the EBS volume created from Snapshot copy

11. Now connect to Divya-Machine C and create a new storage directory named DivyaSnapshot Volume and mount it.

12. switch to the Divya-Snapshot Volume directory and check the list of files in it.

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root@ip-172-31-34-50:/home/ec2-user/divya-snapshotVolume

_____ https://aws.amazon.com/amazon-linux-2/ 19 package(s) needed for security, out of 31 available Run "sudo yum update" to apply all updates. [ec2-user@ip-172-31-34-50 ~]\$ sudo su [root@ip-172-31-34-50 ec2-user]# lsblk NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT 202:0 0 8G 0 disk xvda 202:1 0 8G 0 part / 202:80 0 1G 0 disk └_xvda1 202:1 xvdf [root@ip-172-31-34-50 ec2-user]# df -hT Size Used Avail Use% Mounted on Type Filesystem devtmpfs devtmpfs 474M 0 474M 0%/dev tmpfs tmpfs 483M 0 483M 0%/dev/shm tmpfs tmpfs 483M 412K 483M 1% /run tmpfs tmpfs 483M 0 483M 0% /sys/fs/cgroup /dev/xvda1 8.0G 1.6G 6.5G 20% / xfs tmpfs 97M 0 97M 0% /run/user/1000 tmpfs [root@ip-172-31-34-50 ec2-user]# fdisk -1 Disk /dev/xvda: 8 GiB, 8589934592 bytes, 16777216 sectors Units: sectors of 1 * 512 = 512 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disklabel type: gpt Disk identifier: DA90AB95-8C11-4BAE-9157-C48213FBAD0C Device Start End Sectors Size Type /dev/xvda128 2048 4095 2048 1M BIOS boot Partition table entries are not in disk order. Disk /dev/xvdf: 1 GiB, 1073741824 bytes, 2097152 sectors Units: sectors of 1 * 512 = 512 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes [root@ip-172-31-34-50 ec2-user]# mkdir divya-snapshotVolume [root@ip-172-31-34-50 ec2-user]# mount -t xfs /dev/xvdf /home/ec2-user/divya-snapshotVolume/ [root@ip-172-31-34-50 ec2-user]# ls [root@ip-172-31-34-50 ec2-user]# cd divya-snapshotVolume [root@ip-172-31-34-50 divya-snapshotVolume]# ls 10.txt 1.txt 2.txt 3.txt 4.txt 5.txt 6.txt 7.txt 8.txt 9.txt [root@ip-172-31-34-50 divya-snapshotVolume]#

Fig 11: Divya-Machine C Snapshot Volume

4. AMI

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An Amazon Machine Image (AMI) is a template that contains a software configuration (for example, an operating system, an application server, and applications). From an AMI, you launch an instance, which is a copy of the AMI running as a virtual server in the cloud.

Steps:

• Created an Divya-Machine1 Instance and in the security-groups add inbound rule http port 80 for this machine.

• Connect to the above instance and perform the below commands

aws III Services Q Sea	rch	[Alt+S]	∑ 💠 ⊘ Oregon ▼ Divya Koganti ▼
New EC2 Experience X	Instances (1/1) Info	C Connect Instance	e state V Actions V Launch instances V
	Q Find instance by attribute or tag (case-sensitive)		< 1 > @
EC2 Dashboard	✓ Name ▼ Instance ID I	nstance state 🛛 🔻 Instance type 🔻 Status check	Alarm status Availability Zone ▼ Public IPv4 DNS
EC2 Global View	✓ Divya-Machine1 i-0f046c9893a2af0a9 (Running @ t2.micro Initializing	No alarms + us-west-2c ec2-35-90-193-1
Events	4		•
Tags			
Limits			
▼ Instances			
	Instance: i-0f046c9893a2af0a9 (Divya-Machine	=	@ × Î
Instances New	Instance. 1-01040C5055azarba5 (Divya-Hacimie	= 1)	
Instance Types	Details Security Networking Storage	Status checks Monitoring Tags	
Launch Templates			
Spot Requests	▼ Instance summary Info		
Savings Plans	Instance ID	Public IPv4 address	Private IPv4 addresses
Reserved Instances New	i-Of046c9893a2af0a9 (Divya-Machine1)	🗇 35.90.193.116 open address 🗹	172.31.3.246
Dedicated Hosts	IPv6 address	Instance state	Public IPv4 DNS
Scheduled Instances	-	⊘ Running	cc2-35-90-193-116.us-west-2.compute.amazonaws.com open address
Canacity Reservations			_

Fig12: Divya-Machine1

Preparing your Ubuntu server

- 1. sudo apt update
- 2. sudo ufw allow ssh
- 3. sudo ufw allow 80
- 4. sudo ufw allow 443
- 5. sudo ufw enable

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🔀 ubuntu@ip-172-31-3-246: ~	
allow ARGS	add allow rule
deny ARGS	add deny rule
reject ARGS	add reject rule
limit ARGS	add limit rule
delete RULE NUM	delete RULE
insert NUM RULE	insert RULE at NUM
prepend RULE	prepend RULE
route RULE	add route RULE
route delete RULE NUM	delete route RULE
route insert NUM RULE	insert route RULE at NUM
reload	reload firewall
reset	reset firewall show firewall status
status status numbered	show firewall status show firewall status as numbered list of RULES
status verbose	snow triewall status as numbered list of RULES show the status of RULES show the sho
show ARG	show firewall status
version	display version information
Version	uisplay version intermetion
Application profile commands:	
app list	list application profiles
app info PROFILE	show information on PROFILE
app update PROFILE	update PROFILE
app default ARG	set default application policy
Firewall is active and enabled o uburtu@ip-172-31-3-246:-4\$ sudo a Reading package lists Done Building dependency tree Dane Reading state information Don The following additional package apache2-bin apache2-data apach Suggested packages: apache2-doc apache2-suexec-pri The following NEW packages will apache2-doc apache2-bin apache2-da 0 upgraded, 13 newly installed,	<pre>fw allow 80 fw allow 443 fw enable connections. Proceed with operation (y n)? y n system startup pt install apache2 se s</pre>
Need to get 2136 kB of archives. After this operation, 8505 kB of	additional disk space will be used.

Fig13: Preparing Ubuntu server

- Installing and testing Apache2
- 1. sudo apt install apache2
- 2. sudo systemctl status apache2
- 3. http://YOURSERVERIPADDRESS/

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-3-246:~$ sudo systemctl status apache2
 apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Sat 2022-12-10 17:19:18 UTC; 39s ago
      Docs: https://httpd.apache.org/docs/2.4/
  Main PID: 2433 (apache2)
Tasks: 55 (limit: 1143)
     Memory: 4.9M
        CPU: 29ms
     CGroup: /system.slice/apache2.service
              —2433 /usr/sbin/apache2 -k start
              —2435 /usr/sbin/apache2 -k start
             └─2436 /usr/sbin/apache2 -k start
Dec 10 17:19:18 ip-172-31-3-246 systemd[1]: Starting The Apache HTTP Server...
Dec 10 17:19:18 ip-172-31-3-246 systemd[1]: Started The Apache HTTP Server.
ubuntu@ip-172-31-3-246:~$
```

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Fig 14: Testing apache2

← → C ▲ Not secure 35.90.193.116		臣 \$
	Apache2 Default Page	
	This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server. If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.	
	Configuration Overview	
	Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz . Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.	
	The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:	
	<pre>//etc/apache2/ apache2.conf mods-enabled *.load *.conf conf-enabled *.conf sites-enabled *.conf</pre>	

Fig 15: Testing apache2 on browser

- Installing and testing PHP
 - 1. sudo apt install php8.1
 - 2. php --version
 - 3. sudo systemctl restart apache2
 - 4. echo " | sudo tee -a /var/www/html/phpinfo.php > /dev/null
 - 5. http://YOURSERVERIPADDRESS/phpinfo.php

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2 ubuntu@ip-172-31-3-246: / update-alternatives: using /usr/bin/php8.1 to provide /usr/bin/php (php) in auto mode update-alternatives: using /usr/bin/phar8.1 to provide /usr/bin/phar (phar) in auto mode update-alternatives: using /usr/bin/phar.phar8.1 to provide /usr/bin/phar.phar (phar.phar) in auto mode Creating config file /etc/php/8.1/cli/php.ini with new version Setting up libapache2-mod-php8.1 (8.1.2-1ubuntu2.9) ... Creating config file /etc/php/8.1/apache2/php.ini with new version Nodule mpm event disabled. Enabling module mpm_prefork. apache2_switch_mpm Switch to prefork apache2_invoke: Enable module php8.1 Setting up php8.1 (8.1.2-1ubuntu2.9) ... Processing triggers for man-db (2.10.2-1) ... Processing triggers for php8.1-cli (8.1.2-lubuntu2.9) ... Processing triggers for libapache2-mod-php8.1 (8.1.2-1ubuntu2.9) ... Scanning processes... Scanning linux images... Running kernel seems to be up-to-date. No services need to be restarted. No containers need to be restarted. No user sessions are running outdated binaries. No VM guests are running outdated hypervisor (qemu) binaries on this host. lbuntu@ip-172-31-3-246:~\$ cd / buntu@ip-172-31-3-246:/\$ php --version PHP 8.1.2-1ubuntu2.9 (cli) (built: Oct 19 2022 14:58:09) (NTS) Copyright (c) The PHP Group Zend Engine v4.1.2, Copyright (c) Zend Technologies with Zend OPcache v8.1.2-1ubuntu2.9, Copyright (c), by Zend Technologies buntu@ip-172-31-3-246:/\$ udo systemctl restart apache2 Command 'udo' not found, but can be installed with: sudo apt install udo ubuntu@ip-172-31-3-246:/\$ sudo systemctl restart apache2 ubuntu@ip-172-31-3-246:/\$ echo '<?php phpinfo(); ?>' | sudo tee -a/var/www/html/phpinfo.php>/dev/null tee: invalid option -- '/' Try 'tee --help' for more information. ubuntu@ip-172-31-3-246:/\$ echo '<?php phpinfo(); ?>' | sudo tee-a/var/www/html/phpinfo.php>/dev/null sudo: tee-a/var/www/html/phpinfo.php: command not found ibuntu@ip-172-31-3-246:/\$ echo '<?php phpinfo(); ?>' | sudo tee -a /var/wwww/html/phpinfo.php > /dev/null tee: /var/wwww/html/phpinfo.php: No such file or directory ubuntu@ip-172-31-3-246:/\$ echo '<?php phpinfo(); ?>' | sudo tee -a /var/www/html/phpinfo.php > /dev/null buntu@ip-172-31-3-246:/\$ sudo systemctl restart apache2 buntu@ip-172-31-3-246:/\$ echo '<?php phpinfo(); ?>' | sudo tee -a /var/www/html/phpinfo.php > /dev/null buntu@ip-172-31-3-246:/\$ _

Fig 16: Connecting PHP

Koganti Divya

← → C ▲ Not secure | 35.90.193.116/phpinfo.php

PHP Version 8.1.2-1ubuntu2.9	php
System	Linux ip-172-31-3-246 5.15.0-1026-aws #30-Ubuntu SMP Wed Nov 23 14:15:21 UTC 2022 x86_64
Build Date	Oct 19 2022 14:58:09
Build System	Linux
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/8.1/apache2
Loaded Configuration File	/etc/php/8.1/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/8.1/apache2/conf.d
Additional .ini files parsed	IdeCiphp/8.1 [apache2/conf d10-opcache ini, IdeCiphp/8.1 (apache2/conf d10-pdo ini, /etc)php/8.1 [apache2/conf d20-calendar.ini, /etc)php/8.1 (apache2/conf d20-ctype ini, /etc)php/8.1 [apache2/conf d20-exil ini, /etc)php/8.1 (apache2/conf d20-dtpe ini, /etc)php/8.1 [apache2/conf d20-exil ini, /etc)php/8.1 (apache2/conf d20-dtpe ini, /etc)php/8.1 (apache2/conf d20-dtpe) /etc)php/8.1 [apache2/conf d20-convini, /etc)php/8.1 (apache2/conf d20-dtpe) /etc)php/8.1 [apache2/conf d20-convini, /etc)php/8.1 [apache2/conf d20-symma ini,
PHP API	20210902
PHP Extension	20210902
Zend Extension	420210902
Zend Extension Build	API420210902,NTS
PHP Extension Build	API20210902,NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	disabled
IPv6 Support	enabled
DTrace Support	available, disabled
Registered PHP Streams	https, ftps, compress.zlib, php, file, glob, data, http, ftp, phar
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2, tlsv1.3



5. Load Balancer

Steps:

- Create a EC2 machine (Divya-A) and add security group with inbound rule allowing SSH and HTTP port.
- Prepare your UBUNTU server and install and test apache2
- Install and test PHP8.1

• Create an AMI and create two instances from AMI with security group allowing inbound rule for SSH and HTTP port.

Koganti Divya

aws Services Q Search		[Alt+S]	کے کے Sydney	▼ Divya Koganti ▼
New EC2 Experience X	Instances (1/1) Info	C Connect Instance	state Actions Launch ins	
	Q Find instance by attribute or tag (case-sensitive)			< 1 > @
EC2 Dashboard	✓ Name ♥ Instance ID	Instance state ∇ Instance type ∇ Status check	Alarm status Availability Zone	▼ Public IPv4 D
EC2 Global View	☑ Divya-A i-05766c3eb1f67998f	⊘ Running ⊕ Q t2.micro ④ Initializing	No alarms 🕂 ap-southeast-2b	ec2-3-26-176
Events 4				
Tags				
Limits				
▼ Instances				
Instances New				
Instance Types				
Launch Templates	Instance: i-05766c3eb1f67998f (Divya-A)	=		⊚ × Î
Spot Requests				
Savings Plans	Details Security Networking Storage	Status checks Monitoring Tags		
Reserved Instances New	▼ Instance summary Info			
Dedicated Hosts	Instance ID	Public IPv4 address	Private IPv4 addresses	
Capacity Reservations	i-05766c3eb1f67998f (Divya-A)	□ 3.26.176.20 open address 2	 ☐ 172.31.37.172 	

Fig 18: Divya-A

aws III Services Q Search		[Alt+S]		ک \$	⑦ Sydney ▼ Divya Koç
▼ Images ▲ AMIs	EC2 > Security Groups > sg-0f1	a11614c9256fd0 - Divya-LBSG			
AMI Catalog	sg-0f1a11614c925	6fd0 - Divya-LBSG			Actions v
 Elastic Block Store Volumes 	Details				
Snapshots Lifecycle Manager	Security group name Divya-LBSG	Security group ID Security 11614c9256fd0	Description Divya-LBSG	VPC ID	569106aff91b99 🔀
Network & Security Security Groups Elastic IPs Placement Groups Key Pairs	Owner	Inbound rules count 2 Permission entries	Outbound rules count 1 Permission entry		
Network Interfaces	Inbound rules (2)			C Manage tags	Edit inbound rules
Target Groups New	Q Filter security group rules				< 1 > ©
Auto Scaling Launch Configurations	Name V	Security group rule V IP version	⊽ Туре	♥ Protocol	♥ Port range
Auto Scaling Groups	-	sgr-0a688857b25865 IPv4	HTTP	тср	80
		sgr-02928ba32af370c1c IPv4	SSH	TCP	22

Fig 19: Security Group- Divya-LBSG for Load Balancer

• Under Load balancing from EC2 service click on Load Balancer and click on create a load balancer.

• Click on create Application load balancer and Give name to your load balancer (DivyaAPLB) and select all mappings under Network Mapping.

- Under security groups create a new security group allowing inbound rules for SSH and HTTP port.
- Under Listeners and routing, need to create a new target group (Divya-APLBTG) and include your target machines under it.
- Now connect your Target Group to your Load balancer and click on create

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aws III Services Q Search	[Alt+S]	D		Divya Koganti 🔻
New EC2 Experience X	EC2 > Target groups			٩
EC2 Dashboard EC2 Global View Events	Target groups (1/1) Info Q. Search or filter target groups	C Actions V	Create target group	0
Tags Limits	Image: Name Image: Name Image: ARN Image: Port Image: Protocol Image: Name Image: Nam Image: Nam	7 Target type		_
▼ Instances Instances New Instance Types	(•
Launch Templates Spot Requests Savings Plans Reserved Instances New	Target group: Divya-ALBTG = Details Targets Monitoring Health checks Attributes Tags		:	×
Dedicated Hosts Capacity Reservations	Registered targets (1)	C Deregister	Register targets	
▼ Images AMIs AMI Catalog	Q. Filter resources by property or value □ Instance ID ▼ Name ▼ Port ▼ Zone ▼ Health s	status ⊽ Health sta	< 1 > ③	
Elastic Block Store	i-05766c3eb1f67998f Divya-A 80 ap-southeast-2b (2) initial	l Target regi	istration is in progress	

Fig 20: Target Group

aws III Services	Q Search		[Alt+S]		۵ 4	⑦ Sydney ▼ Divya Koganti
▼ Images AMIs	-	EC2 > Load balancers				
AMI Catalog		Load balancers (1/1)			C Actions ▼	Create load balancer
▼ Elastic Block Store		Elastic Load Balancing scales your load	I balancer capacity automatically in resp	oonse to changes in incoming traffic.		
Volumes		Q Filter by property or value				< 1 > ③
Snapshots						
Lifecycle Manager		✓ Name	DNS name	State 🗢 VPC ID		⊽ Type ⊽ Crea
 Network & Security Security Groups 		Divya-ALB	Divya-ALB-162516297.ap- southeast-2.elb.amazonaws.com	⊘ Active vpc-056569106	aff91b99 3 Availability Zones	application Deci 20:2
Elastic IPs	- 61	4				•

Fig21: Load Balancer

• Now connect to your Load balancer by copying the DNS name and pasting in the browser.

• You can also check to which machine it is being connected using DNS name/phpinfo.php and you can check the ip address of your machine to which it is being connected

Koganti Divya

🛟 Ubuntu	Apache2 Default Page It works!
installation on Ubuntu systems. It Apache packaging is derived. If yo	used to test the correct operation of the Apache2 server after t is based on the equivalent page on Debian, from which the Ubuntu ou can read this page, it means that the Apache HTTP server installed ou should replace this file (located at /var/www/html/index.html) HTTP server.
	eb site and don't know what this page is about, this probably means ble due to maintenance. If the problem persists, please contact the
	Configuration Overview
into several files optimized for into documented in /usr/share/do documentation. Documentation fo apache2-doc package was installed	ration is different from the upstream default configuration, and split eraction with Ubuntu tools. The configuration system is fully oc/apache2/README.Debian.gz . Refer to this for the full or the web server itself can be found by accessing the manual if the d on this server. bache2 web server installation on Ubuntu systems is as follows:
·····	

Fig22: Connecting to UBUNTU using Load balancer

Koganti Divya

PHP Version 8.1.2-1ubuntu2.9

php

System	Linux ip-172-31-37-81 5.15.0-1026-aws #30-Ubuntu SMP Wed Nov 23 14:15:21 UTC 2022 x86_64	
Build Date	Oct 19 2022 14:58:09	
Bulld System	Linux	
Server API	Apache 2.0 Handler	
Virtual Directory Support	disabled	
Configuration File (php.ini) Path	/etc/php/8.1/apache2	
Loaded Configuration File	/etc/php/8.1/apache2/php.ini	
Scan this dir for additional .ini files	/etc/php/8.1/apache2/conf.d	
Additional .ini files parsed	i files parsed /etc/php/8.1/apache2/conf.d/10-opcache ini, /etc/php/8.1/apache2/conf.d/10-pdo.ini, /etc/php/8.1/apache2/conf.d/20-calendar.ini, /etc/php/8.1/apache2/conf.d/20-ctype.ini, /etc/php/8.1/apache2/conf.d/20-exilin, /etc/php/8.1/apache2/conf.d/20-gettext.ini, /etc/php/8.1/apache2/conf.d/20-exilin, /etc/php/8.1/apache2/conf.d/20-gettext.ini, /etc/php/8.1/apache2/conf.d/20-readine.ini, /etc/php/8.1/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.1/apache2/conf.d/20-sysvem ini, /etc/php/8.1/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.1/apache2/conf.d/20-sysvem ini, /etc/php/8.1/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.1/apache2/conf.d/20-sysvem ini, /etc/php/8.1/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.1/apache2/conf.d/20-sysvem ini, /etc/php/8.1/apache2/conf.d/20-sysvm.ini, /etc/php/8.1/apache2/conf.d/20-sysvem ini, /etc/php/8.1/apache2/conf.d/20-sysvem.ini,	
PHP API	20210902	
PHP Extension	20210902	
Zend Extension	420210902	
Zend Extension Build	API420210902,NTS	
PHP Extension Build	API20210902.NTS	
Debug Build	n0	
Thread Safety	disabled	
Zend Signal Handling	enabled	
Zend Memory Manager	enabled	
Zend Multibyte Support	disabled	
IPv6 Support	enabled	
DTrace Support	available, disabled	

Fig23: Connecting to PHP using Load balancer