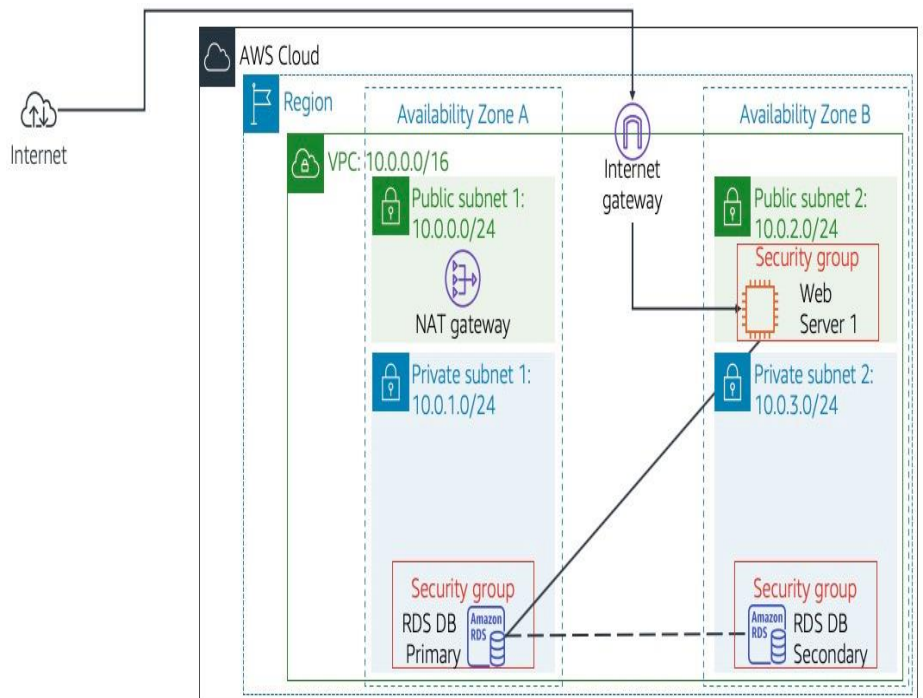


October project

New project launches In AWS

Project : Migrating local databases to Amazon RDS

Hello, my name: Aya Rabi working! Dev-ops engineering in multinational lovely company and today we will learn Migrating local databases to Amazon RDS Architecture and Multi AZ RDS. This project it is so critical to lean it and get more info for cloud and AWS. So, in this documentation you will find all steps you need it to create it with deep details.



Create by Aya Rabi

Create: ec2 instance named application

Launch an instance [Info](#)

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags [Info](#)

Name

appalcation

[Add additional tags](#)

▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

🔍 Search our full catalog including 1000s of application and OS images

Quick Start

Amazon Machine Image (AMI)

Ubuntu Server 22.04 LTS (HVM), SSD Volume Type

ami-053b0d53c279acc90 (64-bit (x86)) / ami-0a0c8eebcdd6dcdbd0 (64-bit (Arm))

Virtualization: hvm ENA enabled: true Root device type: ebs

Free tier eligible

Description

Canonical, Ubuntu, 22.04 LTS, amd64 jammy image build on 2023-05-16

Architecture

64-bit (x86)

AMI ID

ami-053b0d53c279acc90

Verified provider

create your key pair and save it necessary to complete your project

Create key pair



Key pair name

Key pairs allow you to connect to your instance securely.

app

The name can include upto 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type



RSA

RSA encrypted private and public key pair



ED25519

ED25519 encrypted private and public key pair

Private key file format



.pem

For use with OpenSSH



.ppk

For use with PuTTY



When prompted, store the private key in a secure and accessible location on your computer. **You will need it later to connect to your instance.** [Learn more](#)

Cancel

Create key pair

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

app

Create new key pair

Network settings

VPC - required

vpc-0b99cf48dedf48e03 (app-vpc)
10.0.0.0/24

Subnet

subnet-0ce09e7de29469515
VPC: vpc-0b99cf48dedf48e03 Owner: 038601000160 Availability Zone: us-east-1a
IP addresses available: 11 CIDR: 10.0.0.0/28

Create new subnet

Auto-assign public IP

Disable

Firewall (security groups)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group

Select existing security group

Security group name - required

sg-app

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and .-:/!@,[@!+=&:[]!\$*

Description - required

launch-wizard-1 created 2023-10-05T12:19:16.692Z

Inbound Security Group Rules

Security group rule 1 (TCP, 22, 0.0.0.0/0)

Remove

Type

ssh

Protocol

TCP

Port range

22

Source type

Anywhere

Source

Add CIDR, prefix list or security

0.0.0.0/0

Description - optional

e.g. SSH for admin desktop

Add security group rule

Advanced network configuration

Configure storage

Advanced

1x 8 GiB gp2 Root volume (Not encrypted)

Summary

Number of instances

1

Software Image (AMI)

Canonical, Ubuntu, 22.04 LTS, ...read more
ami-053b0d53c279acc90

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel

Launch instance

Review commands

Create VPC with your app this VPC we will use it when we will create database

Create VPC [Info](#)

A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.

VPC settings

Resources to create [Info](#)

Create only the VPC resource or the VPC and other networking resources.

☒ VPC only

☐ VPC and more

Name tag - optional

Creates a tag with a key of 'Name' and a value that you specify.

app-vpc

IPv4 CIDR block [Info](#)

☒ IPv4 CIDR manual input

☐ IPAM-allocated IPv4 CIDR block

IPv4 CIDR

10.0.0.0/24

CIDR block size must be between /16 and /28.

IPv6 CIDR block [Info](#)

☒ No IPv6 CIDR block

☐ IPAM-allocated IPv6 CIDR block

☐ Amazon-provided IPv6 CIDR block

☐ IPv6 CIDR owned by me

Tenancy [Info](#)

Default

Tags

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key

Q Name X

Value - optional

Q app-vpc X

Remove tag

Add tag

You can add 49 more tags

Cancel

Create VPC

Now we will create subnet

Create subnet [Info](#)

VPC

VPC ID

Create subnets in this VPC.

vpc-0b99cf48dedf48e03 (app-vpc) ▼

Associated VPC CIDRs

IPv4 CIDRs

10.0.0.0/24

Subnet settings

Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 1

Subnet name

Create a tag with a key of 'Name' and a value that you specify.

subnet-app

The name can be up to 256 characters long.

Availability Zone [Info](#)

Choose the zone in which your subnet will reside, or let Amazon choose one for you.

US East (N. Virginia) / us-east-1a ▼

IPv4 VPC CIDR block [Info](#)

Choose the IPv4 VPC CIDR block to create a subnet in.

10.0.0.0/24 ▼

IPv4 subnet CIDR block

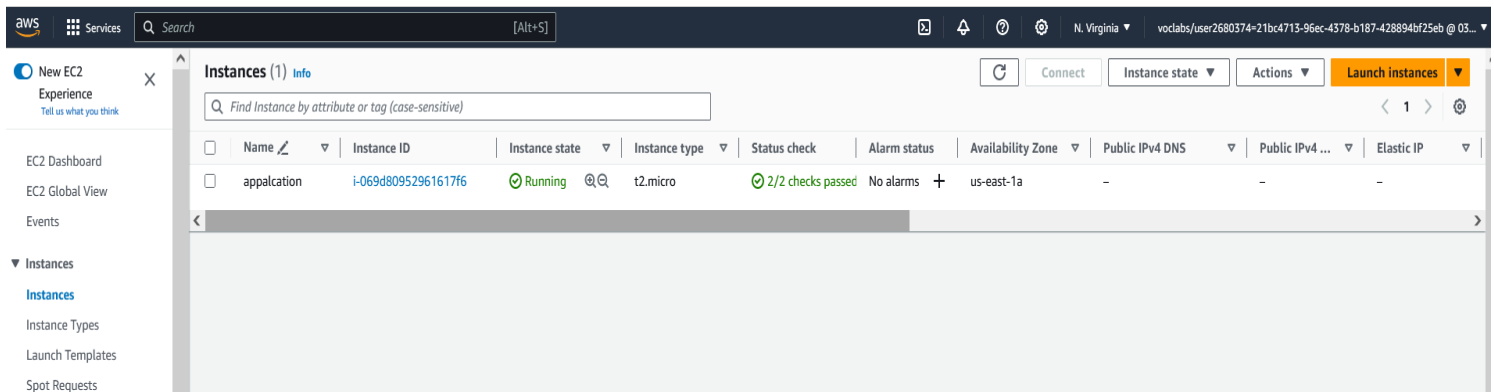
10.0.0.0/28

< > ^ v

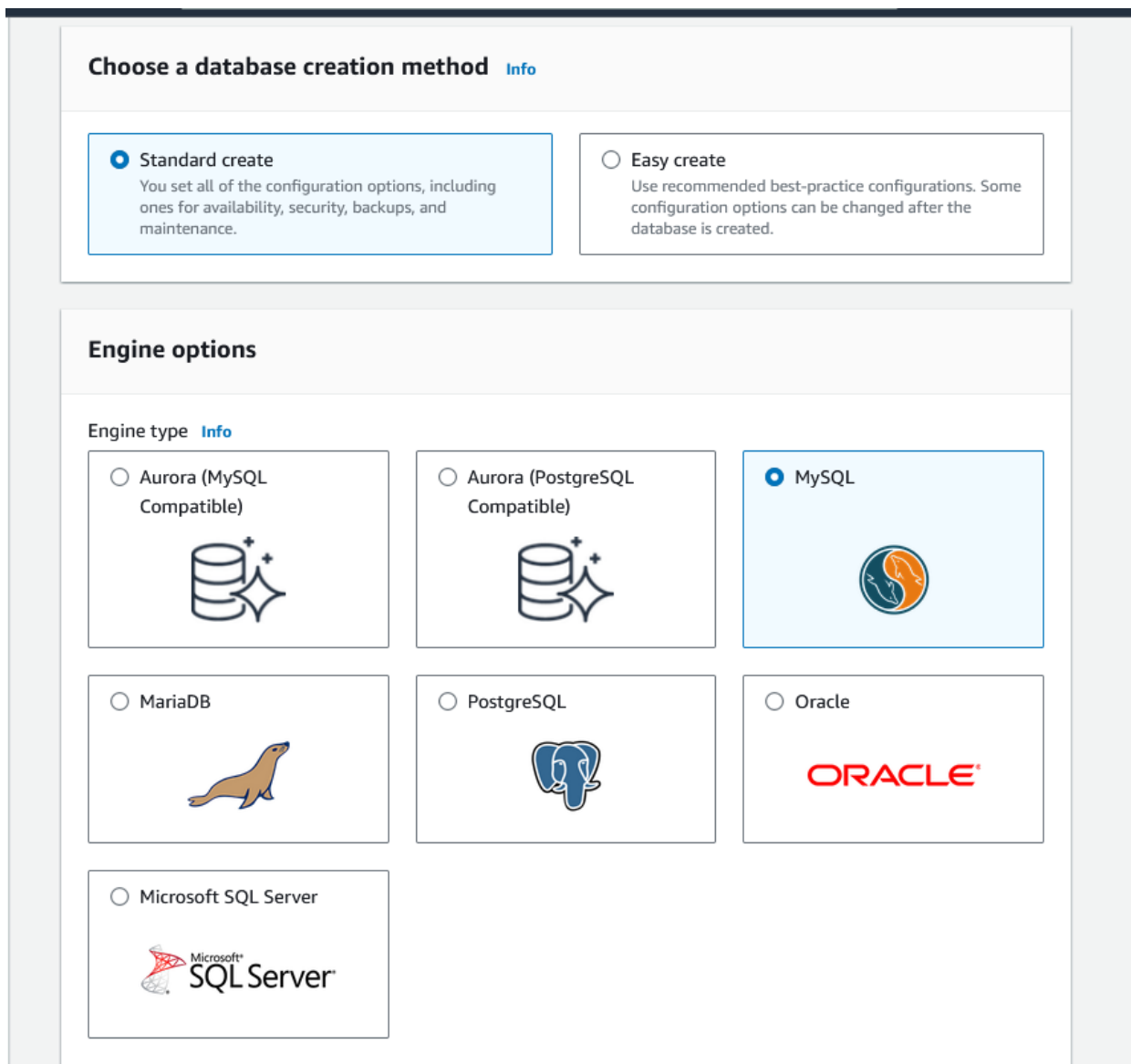
▼ **Tags - optional**

Key	Value - optional	
<input type="text" value="Name"/>	<input type="text" value="subnet-app"/>	<input type="button" value="Remove"/>
<input type="button" value="Add new tag"/>		
<p>You can add 49 more tags.</p>		
<input type="button" value="Remove"/>		
<input type="button" value="Add new subnet"/>		

After you lunch your instance for your web server



Now we will create our RDS database MySQL



▼ Hide filters

- ☒ **Show versions that support the Multi-AZ DB cluster** [Info](#)
Create a Multi-AZ DB cluster with one primary DB instance and two readable standby DB instances. Multi-AZ DB clusters provide up to 2x faster transaction commit latency and automatic failover in typically under 35 seconds.
- ☐ **Show versions that support the Amazon RDS Optimized Writes** [Info](#)
Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

Engine Version

MySQL 8.0.33

Templates

Choose a sample template to meet your use case.

☐ **Production**

Use defaults for high availability and fast, consistent performance.

☒ **Dev/Test**

This instance is intended for development use outside of a production environment.

☐ **Free tier**

Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS. [Info](#)

Availability and durability

Deployment options [Info](#)

The deployment options below are limited to those supported by the engine you selected above.

- ☒ **Single DB instance**
Creates a single DB instance with no standby DB instances.
- ☐ **Multi-AZ DB instance**
Creates a primary DB instance and a standby DB instance in a different AZ. Provides high availability and data redundancy, but the standby DB instance doesn't support connections for read workloads.
- ☐ **Multi-AZ DB Cluster - new**
Creates a DB cluster with a primary DB instance and two readable standby DB instances, with each DB instance in a different Availability Zone (AZ). Provides high availability, data redundancy, and automatic failover to standby instances.

Settings

DB instance identifier [Info](#)

Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.

app-db

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

▼ Credentials Settings

Master username [Info](#)

Type a login ID for the master user of your DB instance.

admin

1 to 16 alphanumeric characters. The first character must be a letter.

- ☐ **Manage master credentials in AWS Secrets Manager**
Manage master user credentials in Secrets Manager. RDS can generate a password for you and manage it throughout its lifecycle.

[i](#) If you manage the master user credentials in Secrets Manager, some RDS features aren't supported. [Learn more](#)

- ☐ **Auto generate a password**
Amazon RDS can generate a password for you, or you can specify your own password.

Master password [Info](#)

••••••••

Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), ' (single quote), " (double quote) and @ (at sign).

Confirm master password [Info](#)

••••••••

We will create it using burstable classes dbt3.micro

DB instance class [Info](#)

- ☐ Standard classes (includes m classes)
- ☐ Memory optimized classes (includes r and x classes)
- ☒ Burstable classes (includes t classes)

db.t3.micro

2 vCPUs 1 GiB RAM Network: 2,085 Mbps

☐ Include previous generation classes

Storage

Storage type [Info](#)

General Purpose SSD (gp2)

Baseline performance determined by volume size

Allocated storage [Info](#)

20

GiB

The minimum value is 20 GiB and the maximum value is 6,144 GiB

ⓘ Provisioning less than 100 GiB of General Purpose (SSD) storage for high throughput workloads could result in higher latencies upon exhaustion of the initial General Purpose (SSD) IO credit balance. [Learn more](#)

ⓘ After you modify the storage for a DB instance, the status of the DB instance will be in storage-optimization. Your instance will remain available as the storage-optimization operation completes.

Compute resource

Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

☒ Don't connect to an EC2 compute resource
Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

☐ Connect to an EC2 compute resource
Set up a connection to an EC2 compute resource for this database.

Virtual private cloud (VPC) [Info](#)

Choose the VPC. The VPC defines the virtual networking environment for this DB instance.

app-vpc (vpc-0b99cf48dedf48e03)

1 Subnets, 1 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

ⓘ After a database is created, you can't change its VPC.

DB subnet group [Info](#)

Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.

Create new DB Subnet Group

Public access [Info](#)

- ☐ Yes
RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.
- ☒ No
RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall) [Info](#)

Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

☒ Choose existing
Choose existing VPC security groups

☐ Create new
Create new VPC security group

Database authentication options [Info](#)

☒ Password authentication

Authenticates using database passwords.

☐ Password and IAM database authentication

Authenticates using the database password and user credentials through AWS IAM users and roles.

☐ Password and Kerberos authentication

Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

Monitoring

Monitoring

☐ Enable Enhanced monitoring

Enabling Enhanced monitoring metrics are useful when you want to see how different processes or threads use the CPU.

▼ Additional configuration

Database options, encryption turned on, backup turned off, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

Database options

Initial database name [Info](#)

If you do not specify a database name, Amazon RDS does not create a database.

DB parameter group [Info](#)

(default) aws/rds

Account
038601000160

KMS key ID
ee7c47e8-e75c-4a39-91fa-cde3b347db93

Log exports
Select the log types to publish to Amazon CloudWatch Logs
☐ Audit log
☐ Error log
☐ General log
☐ Slow query log

IAM role
The following service-linked role is used for publishing logs to CloudWatch Logs.
RDS service-linked role

Maintenance
Auto minor version upgrade [Info](#)
☐ Enable auto minor version upgrade
Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

Maintenance window [Info](#)
Select the period you want pending modifications or maintenance applied to the database by Amazon RDS.
☐ Choose a window
☒ No preference

Deletion protection
☐ Enable deletion protection
Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.

You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.

CancelCreate database

Now we will attach our instance to connect with database.

Connected compute resources (0) [Info](#)

Actions

Connections to compute resources that were created automatically by RDS are shown here. Connections to compute resources that were created manually aren't shown.

Filter by compute resources

< 1 >

Resource identifier

Resource type

Availability Zone

VPC security group

Compute resource security group

Connected proxy

No connected compute resources
No connected compute resources that were created automatically to display.

Set up EC2 connection

Set up Lambda connection

[RDS](#)

>

[Databases](#)

>

Set up EC2 connection

Step 1

Set up EC2 connection

Step 2

Review and confirm

Set up EC2 connection

Info

Select EC2 instance

Database
app

EC2 instance
Choose the EC2 instance to connect to this database. Only EC2 instances in the same VPC as the database are shown. If no EC2 instances in the same VPC are available, you can create a new EC2 instance.

i-090b1128083574fee
application us-east-1c

↻

[Create EC2 instance](#)

Cancel

Continue

After you create it will send you pop to make sure that you want to attach your database with your ec2

Connection summary

Info

You are setting up a connection between RDS database [app](#) and EC2 instance [i-090b1128083574fee](#).

To set up a connection between the database and the EC2 instance, VPC security group *rds-ec2-1* is added to the database, and VPC security group *ec2-rds-1* is added to the EC2 instance.

VPC: vpc-00ef7a5c9420f4764 (-)

Security group:
rds-ec2-1 (connection rule)

RDS

app

Port: 3306

Security group:
ec2-rds-1 (connection rule)

EC2

i-090b1128083574fee

Bold indicates an addition being made to set up a connection.

Changes to RDS database: app

Attribute	Current value	New value
Security group	default	default, rds-ec2-1

Connected compute resources (1)
[Info](#)

Actions

Connections to compute resources that were created automatically by RDS are shown here. Connections to compute resources that were created manually aren't shown.

< 1 >

Resource identifier	Resource type	Availability Zone	VPC security group	Compute resource security group	Connected proxy
i-090b1128083574fee	EC2 instance	us-east-1c	rds-ec2-1	ec2-rds-1	-

Proxies (0)

Actions

Create proxy

Now we will migrate our source app from local to add it in ec2 instance.

Will use command scp to migrate our files code from local to our instance

Scp -I "key pair" "path for your app in local " "connection ssh" "path in ec2 place you will add your project in it

```

aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/ ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/
/home/aya/cafe-app/cafe/AWSSDK/
/home/aya/cafe-app/cafe/css/
/home/aya/cafe-app/cafe/ec2.pem
/home/aya/cafe-app/cafe/getAppParameters.php
/home/aya/cafe-app/cafe/images/
/home/aya/cafe-app/cafe/index.php
/home/aya/cafe-app/cafe/menu.php
/home/aya/cafe-app/cafe/orderHistory.php
/home/aya/cafe-app/cafe/processOrder.php
/home/aya/cafe-app/cafe/serverInfo.php
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/css/ ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/
/home/aya/cafe-app/cafe/css: not a regular file
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/index.php ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/
index.php      100% 3481   8.2KB/s   00:00
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/menu.php ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/
menu.php       100% 4991  20.4KB/s  00:00
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/* ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/
/home/aya/cafe-app/cafe/AWSSDK: not a regular file
/home/aya/cafe-app/cafe/css: not a regular file
ec2.pem        100% 1674   8.3KB/s   00:00
getAppParameters.php 100% 1051   4.7KB/s   00:00
/home/aya/cafe-app/cafe/images: not a regular file
index.php      100% 3481  15.1KB/s   00:00
menu.php       100% 4991  20.1KB/s   00:00
orderHistory.php 100% 3408  12.8KB/s   00:00
processOrder.php 100% 3839  13.5KB/s   00:00
serverInfo.php 100% 660   3.4KB/s   00:00
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/css/* ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/
^Z
[1]+  Stopped                  scp -i app.pem /home/aya/cafe-app/cafe/css/* ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/css/* ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/css/
menu.css       100% 1183   6.0KB/s   00:00
styles.css     100% 1319   6.3KB/s   00:00
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/image/* ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/image/
/home/aya/cafe-app/cafe/image/*: No such file or directory
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/image/* ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/image/
/home/aya/cafe-app/cafe/image/*: No such file or directory
aya@aya-Latitude-E6540:~/lab$ scp -i app.pem /home/aya/cafe-app/cafe/images/* ubuntu@ec2-23-22-212-163.compute-1.amazonaws.com:/home/ubuntu/image/
Cake-Vitrine.jpg      100% 632KB  39.9KB/s   00:15
Chocolate-Chip-Cookies.jpg 100% 470KB  176.0KB/s   00:02
Coffee-and-Pastries.jpg 100% 475KB  206.5KB/s   00:02
Coffee.jpg            100% 617KB  260.1KB/s   00:02
Coffee-Shop.jpg       100% 150KB  193.2KB/s   00:00
Cookies.jpg           100% 419KB  239.4KB/s   00:01
Croissants.jpg        100% 344KB  252.4KB/s   00:01
Cup-of-Hot-Chocolate.jpg 100% 309KB  239.6KB/s   00:01
default-image.jpg     100% 92KB   177.6KB/s   00:00
Donuts.jpg            100% 372KB  215.9KB/s   00:01
Frank-Martha.jpg      100% 401KB  217.8KB/s   00:01
Latte.jpg             100% 312KB  224.5KB/s   00:01
Muffins.jpg           100% 238KB  165.6KB/s   00:01
Strawberry-Blueberry-Tarts.jpg 100% 284KB  195.7KB/s   00:01
Strawberry-Tarts.jpg  100% 468KB  198.6KB/s   00:02
aya@aya-Latitude-E6540:~/lab$

```



```
ubuntu@ip-172-31-47-66: ~/AWS SDK
0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Thu Oct 5 19:37:59 2023 from 196.159.134.123
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-47-66:~$ ls
app.pem  getAppParameters.php  menu.php  processOrder.php
ec2.pem  index.php  orderHistory.php  serverInfo.php
ubuntu@ip-172-31-47-66:~$ rm ec2.pem
rm: remove write-protected regular file 'ec2.pem'? yes
ubuntu@ip-172-31-47-66:~$ ls
app.pem  index.php  orderHistory.php  serverInfo.php
getAppParameters.php  menu.php  processOrder.php
ubuntu@ip-172-31-47-66:~$ mkdir css
ubuntu@ip-172-31-47-66:~$ cd css/
ubuntu@ip-172-31-47-66:~/css$ pwd
/home/ubuntu/css
ubuntu@ip-172-31-47-66:~/css$ ls
menu.css  styles.css
ubuntu@ip-172-31-47-66:~/css$ cd ..
ubuntu@ip-172-31-47-66:~$ mkdir image
ubuntu@ip-172-31-47-66:~$ cd image/
ubuntu@ip-172-31-47-66:~/image$ ls
ubuntu@ip-172-31-47-66:~/image$ ls
Cake-Vitrine.jpg  Coffee-and-Pastries.jpg
Chocolate-Chip-Cookies.jpg  Coffee.jpg
ubuntu@ip-172-31-47-66:~/image$ cd ..
ubuntu@ip-172-31-47-66:~$ mkdir AWS SDK
ubuntu@ip-172-31-47-66:~$ cd AWS SDK/
ubuntu@ip-172-31-47-66:~/AWS SDK$ ls
aws.phar
ubuntu@ip-172-31-47-66:~/AWS SDK$
```

After migrate data and add it in instance ping for any app to make sure that your transaction fine

```
ubuntu@ip-172-31-47-66:~$ cd AWS SDK/
ubuntu@ip-172-31-47-66:~/AWS SDK$ ls
aws.phar
ubuntu@ip-172-31-47-66:~/AWS SDK$ cd ..
ubuntu@ip-172-31-47-66:~$ ping google.com
PING google.com (142.251.111.139) 56(84) bytes of data:
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=1 ttl=55 time=2.20 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=2 ttl=55 time=2.24 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=3 ttl=55 time=2.20 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=4 ttl=55 time=2.28 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=5 ttl=55 time=2.24 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=6 ttl=55 time=2.21 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=7 ttl=55 time=2.25 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=8 ttl=55 time=2.24 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=9 ttl=55 time=2.22 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=10 ttl=55 time=2.22 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=11 ttl=55 time=2.22 ms
^Z
[1]+  Stopped                  ping google.com
ubuntu@ip-172-31-47-66:~$
```