

Week 1 Lab

RDS creation:

The screenshot shows the AWS Management Console interface for creating a new RDS database. At the top, there's a navigation bar with the AWS logo, 'Services' dropdown, and a search bar. Below the navigation bar, the breadcrumb 'RDS > Create database' is visible. The main heading is 'Create database'. The first section is 'Choose a database creation method', with two options: 'Standard create' (selected with a blue radio button) and 'Easy create'. The 'Standard create' option includes a description: 'You set all of the configuration options, including ones for availability, security, backups, and maintenance.' The 'Easy create' option includes a description: 'Use recommended best-practice configurations. Some configuration options can be changed after the database is created.' The second section is 'Engine options', with the sub-heading 'Engine type'. It contains three options: 'Amazon Aurora' (with a database icon), 'MySQL' (selected with a blue radio button and a MySQL logo icon), and 'MariaDB' (with a seal icon).

Services Search for services, features, marketplace products, and docs [Alt+S]

RDS > Create database

Create database

Choose a database creation method [Info](#)

☒ **Standard create**
You set all of the configuration options, including ones for availability, security, backups, and maintenance.

☐ **Easy create**
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.

Engine options

Engine type [Info](#)

☐ Amazon Aurora

☒ **MySQL**

☐ MariaDB

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](#)

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.

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens (1 to 15 for SQL Server). 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.

1 to 16 alphanumeric characters. First character must be a letter

PG Program in Cloud Computing

Select the free tier instance if using a personal account. Use a smaller tier to avoid bigger bill amount.

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

Confirm password [Info](#)

DB instance size

DB instance class [Info](#)

Choose a DB instance class that meets your processing power and memory requirements. The DB instance class options below are limited to those supported by the engine you selected above.

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

db.t2.micro

1 vCPUs 1 GiB RAM Not EBS Optimized

[i](#) New instance classes are available for specific engine versions. [Info](#)

☒ Include previous generation classes

Storage

Storage type [Info](#)



General Purpose (SSD) ▼

Allocated storage

20

GiB

(Minimum: 20 GiB, Maximum: 16,384 GiB) Higher allocated storage **may improve** IOPS performance.

 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](#) 

Storage autoscaling [Info](#)

Provides dynamic scaling support for your database's storage based on your application's needs.

☒ **Enable storage autoscaling**

Enabling this feature will allow the storage to increase once the specified threshold is exceeded.

Maximum storage threshold [Info](#)

Charges will apply when your database autoscales to the specified threshold

1000

GiB

Minimum: 21 GiB, Maximum: 16,384 GiB

Availability & durabilityMulti-AZ deployment [Info](#)

- ☐ Create a standby instance (recommended for production usage)
Creates a standby in a different Availability Zone (AZ) to provide data redundancy, eliminate I/O freezes, and minimize latency spikes during system backups.
- ☒ Do not create a standby instance

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

VPC that defines the virtual networking environment for this DB instance.

Default VPC (vpc-21a0b549) ▼

Only VPCs with a corresponding DB subnet group are listed.

After a database is created, you can't change the VPC selection.

Subnet group [Info](#)

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

default-vpc-21a0b549 ▼

Public access [Info](#)

Select the same VPC and subnet group on which your EC2 instance is present. Same AZ as well.

Public access [Info](#)

- ☐ Yes
Amazon EC2 instances and devices outside the VPC can connect to your database. Choose one or more VPC security groups that specify which EC2 instances and devices inside the VPC can connect to the database.
- ☒ No
RDS will not assign a public IP address to the database. Only Amazon EC2 instances and devices inside the VPC can connect to your database.

VPC security group

Choose a VPC security group to allow access to your database. Ensure that the security group rules allow the appropriate incoming traffic.

☐ Choose existing
Choose existing VPC security groups

☒ Create new
Create new VPC security group

New VPC security group name**Availability Zone** [Info](#)**▼ Additional configuration****Database port** [Info](#)

TCP/IP port that the database will use for application connections.

PG Program in Cloud Computing

Select the authenticate via IAM role option

Database authentication

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 (not available for this version)
Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

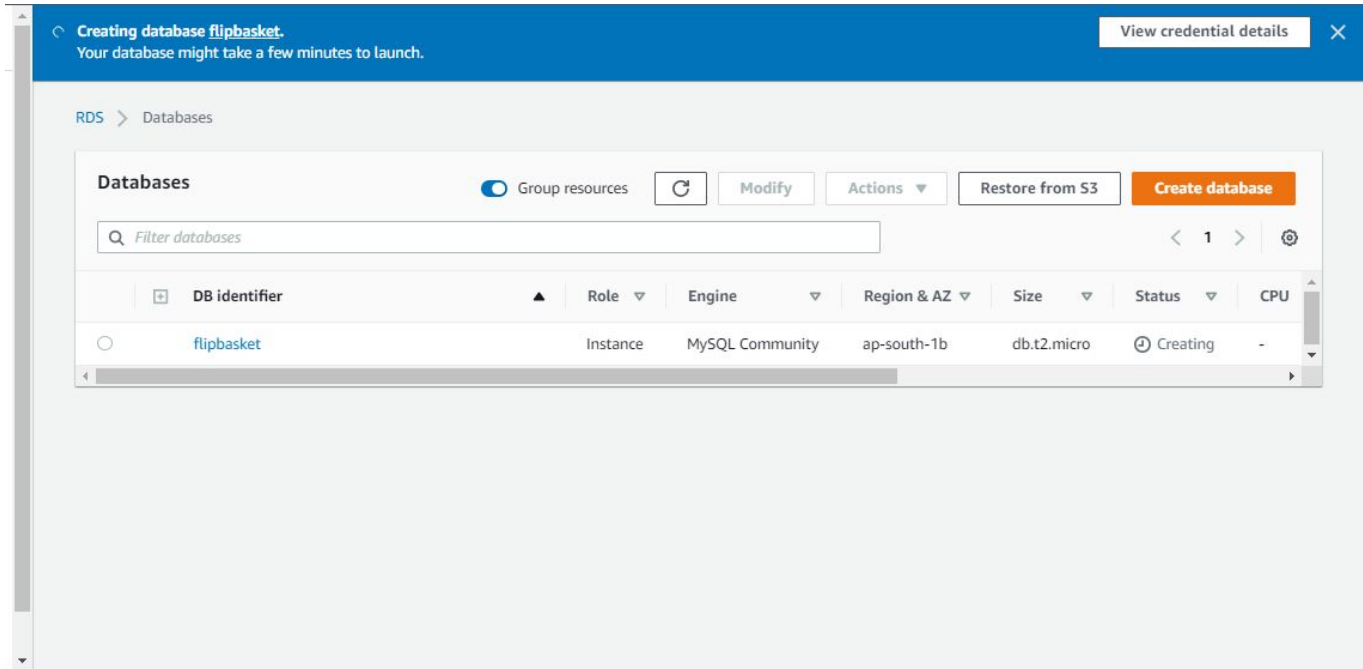
► Additional configuration

Database options, backup enabled, backtrack disabled, Enhanced Monitoring enabled, maintenance, CloudWatch Logs, delete protection disabled

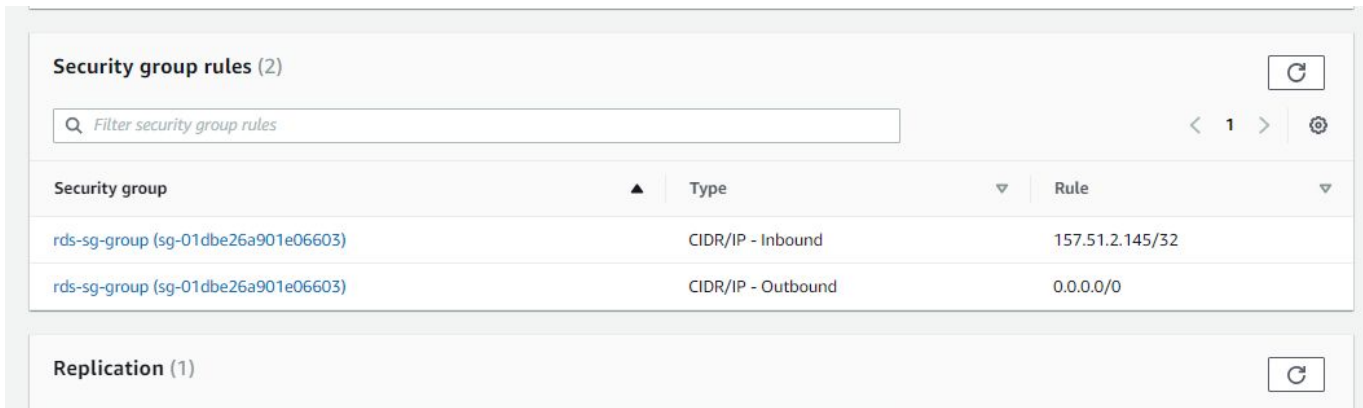
Estimated monthly costs

| | |
|--------------|------------------|
| DB instance | 17.52 USD |
| Storage | 2.62 USD |
| Total | 20.14 USD |

This billing estimate is based on on-demand usage as described in [Amazon RDS Pricing](#) [↗](#). Estimate does not



Security group created by default cannot point to only one IP address



open the subnets CIDR block

EC2 > Security Groups > sg-01dbe26a901e06603 - rds-sg-group > Edit inbound rules

Edit inbound rules [Info](#)

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

Inbound rules [Info](#)

| Type Info | Protocol Info | Port range Info | Source Info | Description - optional Info | |
|---------------------------|-------------------------------|---------------------------------|-----------------------------|---|--|
| MySQL/Aurora | TCP | 3306 | Custom | | <input type="text" value="172.31.0.0/20"/> |
| <div>Add rule</div> | | | | | |

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

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

Launch EC2 with ubuntu server

Instance launched in the same subnet and AZ, since the RDS is restricted to access to private.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

| | | |
|-------------------------------|--|--|
| Number of instances | 1 | Launch into Auto Scaling Group |
| Purchasing option | <input type="checkbox"/> Request Spot instances | |
| Network | vpc-21a0b549 (default) | Create new VPC |
| Subnet | subnet-abbdb8e7 Default in ap-south-1b 4000 IP Addresses available | Create new subnet |
| Auto-assign Public IP | Use subnet setting (Enable) | |
| Placement group | <input type="checkbox"/> Add instance to placement group | |
| Capacity Reservation | Open | |
| Domain join directory | No directory | Create new directory |
| IAM role | None | Create new IAM role |
| CPU options | <input type="checkbox"/> Specify CPU options | |
| Shutdown behavior | Stop | |
| Stop - Hibernate behavior | <input type="checkbox"/> Enable hibernation as an additional stop behavior | |
| Enable termination protection | <input type="checkbox"/> Protect against accidental termination | |

[Cancel](#) [Previous](#) [Review & Launch](#)

Instances (1) Info

Filter instances

Instance state (client): Stopped X Clear filters

| | Name | Instance ID | Instance state | Instance type | Status check | Alarm status | Availability Zone | Public IPv4 DNS | Public IPv4 |
|--------------------------|------------|---------------------|----------------|---------------|--------------|--------------|-------------------|-------------------------|-------------|
| <input type="checkbox"/> | App server | i-0d08972730db03efd | Running | t2.micro | - | No alarms + | ap-south-1b | ec2-13-233-96-213.ap... | 13.233.96.2 |

Select an instance above

IAM role

Creating a new role

Identity and Access Management (IAM)

- Dashboard
- Access management
 - Groups
 - Users
 - Roles**
 - Policies
 - Identity providers
 - Account settings
- Access reports
 - Access analyzer
 - Archive rules
 - Analyzers
 - Settings
- Credential report
- Organization activity
- Service control policies (SCPs)

Search IAM

AWS account ID:

Roles

What are IAM roles?

IAM roles are a secure way to grant permissions to entities that you trust. Examples of entities include the following:

- IAM user in another account
- Application code running on an EC2 instance that needs to perform actions on AWS resources
- An AWS service that needs to act on resources in your account to provide its features
- Users from a corporate directory who use identity federation with SAML

IAM roles issue keys that are valid for short durations, making them a more secure way to grant access.

Additional resources:

- [IAM Roles FAQ](#)
- [IAM Roles Documentation](#)
- [Tutorial: Setting Up Cross Account Access](#)
- [Common Scenarios for Roles](#)

Create role

Delete role

Search

| Role name | Trusted entities | Last |
|---|--|-------|
| <input type="checkbox"/> AWSServiceRoleForRDS | AWS service: rds (Service-Linked role) | Today |
| <input type="checkbox"/> rds-monitoring-role | AWS service: monitoring.rds | Today |

Create role

1

2

3

4

Select type of trusted entity

**AWS service**
EC2, Lambda and others**Another AWS account**
Belonging to you or 3rd party**Web identity**
Cognito or any OpenID provider**SAML 2.0 federation**
Your corporate directoryAllows AWS services to perform actions on your behalf. [Learn more](#)

Choose a use case

Common use cases

EC2

Allows EC2 instances to call AWS services on your behalf.

Lambda

Allows Lambda functions to call AWS services on your behalf.

Or select a service to view its use cases

| | | | | |
|-----------------|------------------------|----------------------------|------------------|-------------|
| API Gateway | CloudWatch Events | EKS | IoT Things Graph | Redshift |
| AWS Backup | CodeBuild | EMR | KMS | Rekognition |
| AWS Chatbot | CodeDeploy | ElastiCache | Kinesis | RoboMaker |
| AWS Marketplace | CodeGuru | Elastic Beanstalk | Lake Formation | S3 |
| AWS Support | CodeStar Notifications | Elastic Container Registry | Lambda | SMS |
| Amplify | Comprehend | Elastic Container Service | Lex | SNS |
| AppStream 2.0 | Config | Elastic Transcoder | License Manager | SWF |
| AppSync | Connect | ElasticLoadBalancing | MQ | SageMaker |

* Required

Cancel

Next: Permissions

Create role

1 2 3 4

▼ Attach permissions policies









Choose one or more policies to attach to your new role.

Create policy



Filter policies

Showing 14 results

| | Policy name | Used as |
|-------------------------------------|--|------------------------|
| <input type="checkbox"/> |  AmazonLambdaRolePolicyForLaunchWizardSAP | None |
| <input type="checkbox"/> |  AmazonRDSBetaServiceRolePolicy | None |
| <input type="checkbox"/> |  AmazonRDSDataFullAccess | None |
| <input type="checkbox"/> |  AmazonRDSDirectoryServiceAccess | None |
| <input type="checkbox"/> |  AmazonRDSEnhancedMonitoringRole | Permissions policy (1) |
| <input checked="" type="checkbox"/> |  AmazonRDSFullAccess | None |
| <input type="checkbox"/> |  AmazonRDSPreviewServiceRolePolicy | None |
| <input type="checkbox"/> |  AmazonRDSReadOnlyAccess | None |

▶ Set permissions boundary

* Required

Cancel

Previous

Next: Tags

Create role

1

2

3

4

Review

Provide the required information below and review this role before you create it.

Role name* EC2-multirole

Use alphanumeric and '+=, @-_' characters. Maximum 64 characters.

Role description Allows EC2 instances to call AWS RDS service on your behalf.

Maximum 1000 characters. Use alphanumeric and '+=, @-_' characters.

Trusted entities AWS service: ec2.amazonaws.com

Policies  AmazonRDSFullAccess [↗](#)

Permissions boundary Permissions boundary is not set

No tags were added.

* Required

Cancel

Previous

Create role

Identity and Access
Management (IAM)

Dashboard

Access management

Groups

Users

Roles

Policies

Identity providers

Account settings

Access reports

Access analyzer

Archive rules

Analyzers

Settings

Credential report

Organization activity

Service control policies (SCPs)

Search IAM

AWS account ID:
351715820252

Additional resources:

- IAM Roles FAQ
- IAM Roles Documentation
- Tutorial: Setting Up Cross Account Access
- Common Scenarios for Roles

✓ The role EC2-multirole has been created.

Create role

Delete role

Search

Showing 23 results

| Role name | Trusted entities | Last activity |
|--|---|---------------|
| <input type="checkbox"/> add-role-dph75g2 | AWS service: lambda | None |
| <input type="checkbox"/> add-role-qjsf0xjq | AWS service: lambda | 69 days |
| <input type="checkbox"/> AmazonSSMRoleForAutomationAssumeQuickSetup | AWS service: ssm | Today |
| <input type="checkbox"/> AmazonSSMRoleForInstancesQuickSetup | AWS service: ec2 | 6 days |
| <input type="checkbox"/> AWSServiceRoleForAmazonElasticFileSystem | AWS service: elasticfilesystem (Service-Link... | 55 days |
| <input type="checkbox"/> AWSServiceRoleForAmazonSSM | AWS service: ssm (Service-Linked role) | Today |
| <input type="checkbox"/> AWSServiceRoleForAmazonSSM_AccountDiscovery | AWS service: accountdiscovery.ssm (Service... | None |
| <input type="checkbox"/> AWSServiceRoleForAutoScaling | AWS service: autoscaling (Service-Linked role) | 77 days |
| <input type="checkbox"/> AWSServiceRoleForBackup | AWS service: backup (Service-Linked role) | Today |

Identity and Access Management (IAM)

Dashboard

▼ Access management

Groups

Users

Roles

Policies

Identity providers

Account settings

▼ Access reports

Access analyzer

Archive rules

Analyzers

Settings

Credential report

Organization activity

Service control policies (SCPs)

 Search IAM

 AWS account ID:
 351715820252

Roles > EC2-multirole

Summary

Delete role

Role ARN: [arn:aws:iam:351715820252:role/EC2-multirole](#)
 Role description: Allows EC2 instances to call AWS RDS service on your behalf. [Edit](#)
 Instance Profile ARNs: [arn:aws:iam:351715820252:instance-profile/EC2-multirole](#)
 Path: /
 Creation time: 2021-01-29 12:48 UTC+0530
 Last activity: Not accessed in the tracking period
 Maximum session duration: 1 hour [Edit](#)

Permissions

Trust relationships

Tags

Access Advisor

Revoke sessions

▼ Permissions policies (1 policy applied)

Attach policies

Add inline policy

| Policy name | Policy type |
|-------------------------------------|--------------------|
| AmazonRDSFullAccess | AWS managed policy |

► Permissions boundary (not set)

Assigning the role to EC2

 New EC2 Experience
 Tell us what you think
EC2 Dashboard **New**

Events

Tags

Limits

Instances

Instances **New**

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts **New**

Capacity Reservations

Images

AMIs

Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

Instances (1/1) Info

Refresh

Connect

Instance state

Actions

Launch Instances

 Filter Instances

Instance state (client): !stopped

Clear filters

| <input checked="" type="checkbox"/> | Name | Instance ID | Instance state | Instance type | Status check | Alarm status | Availability Zone |
|-------------------------------------|------|-------------|----------------|---------------|--------------|--------------|-------------------|
| | | | | | | | |

Change security groups

Get Windows password

Modify IAM role

View details

Manage instance state

Instance settings

Networking

Security

Image and templates

Monitor and troubleshoot

Public IPv4

Instance: i-0d08972730db03efd (App server)

Details

Security

Networking

Storage

Status Checks

Monitoring

Tags

▼ Instance summary Info

Instance ID

i-0d08972730db03efd (App server)

Public IPv4 address

13.233.96.213 | [open address](#)

Private IPv4 addresses

172.31.7.40

Instance state

Public IPv4 DNS

Private IPv4 DNS

EC2 > Instances > i-0d08972730db03efd > Modify IAM role

Modify IAM role [Info](#)

Attach an IAM role to your instance.

Instance ID
i-0d08972730db03efd (App server)

IAM role
Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.

EC2-multirole

Q |

No IAM Role
Choose this option to detach an IAM role

AmazonSSMRoleForInstancesQuickSetup
arn:aws:iam::351715820252:instance-profile/AmazonSSMRoleForInstancesQuickSetup

EC2-multirole
arn:aws:iam::351715820252:instance-profile/EC2-multirole

↺

Create new IAM role [↗](#)

Cancel

Save

×

Successfully attached EC2-multirole to instance i-0d08972730db03efd

Instances (1/1) [Info](#)

↺

Connect

Instance sta

Q Filter instances

Instance state (client): !stopped ✕

Clear filters

| <input checked="" type="checkbox"/> | Name ▾ | Instance ID | Instance state ▾ | Instance type ▾ | Status check | Alarm status | Availi |
|-------------------------------------|------------|---------------------|---------------------------|-----------------|----------------|--------------|--------|
| <input checked="" type="checkbox"/> | App server | i-0d08972730db03efd | Running 🔍 | t2.micro | 2/2 checks ... | No alarms + | ap-soi |

© 2013 - 2021 Great Lakes E-Learning Services Pvt. Ltd. All rights reserved

Installing mysql-client in the ubuntu server

```
Get:39 http://security.ubuntu.com/ubuntu focal-security/multiverse Transta
Get:40 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 c
Fetched 18.0 MB in 8s (2296 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
87 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-7-40:~$ sudo apt install mysql-client
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  mysql-client-8.0 mysql-client-core-8.0 mysql-common
The following NEW packages will be installed:
  mysql-client mysql-client-8.0 mysql-client-core-8.0 mysql-common
0 upgraded, 4 newly installed, 0 to remove and 87 not upgraded.
Need to get 4239 kB of archives.
After this operation, 65.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] |
```

```
Setting up mysql-client-core-8.0 (8.0.22-0ubuntu0.20.04.3) ...
Setting up mysql-client-8.0 (8.0.22-0ubuntu0.20.04.3) ...
Setting up mysql-client (8.0.22-0ubuntu0.20.04.3) ...
Processing triggers for man-db (2.9.1-1) ...
ubuntu@ip-172-31-7-40:~$ wget https://storage.googleapis.com/skl-training/aws-codelabs/rds/employees.sql
--2021-01-29 07:28:37-- https://storage.googleapis.com/skl-training/aws-codelabs/rds/employees.sql
Resolving storage.googleapis.com (storage.googleapis.com)... 142.250.192.144, 142.250.183.80, 2404:6800:4009:827::2010,
...
Connecting to storage.googleapis.com (storage.googleapis.com)|142.250.192.144|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 181531382 (173M) [application/sql]
Saving to: 'employees.sql'

employees.sql          100%[=====] 173.12M  57.5MB/s   in 3.0s

2021-01-29 07:28:40 (57.5 MB/s) - 'employees.sql' saved [181531382/181531382]

ubuntu@ip-172-31-7-40:~$ |
```

```
ubuntu@ip-172-31-7-40:~$ mysql -h flipbasket.ciy0mdpdswpo.ap-south-1.rds.amazonaws.com -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 196
Server version: 5.7.31-log Source distribution

Copyright (c) 2000, 2020, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> |
```



```
ubuntu@ip-172-31-7-40: ~  
Query OK, 1 row affected (0.01 sec)  
  
mysql> use employees;  
Database changed  
mysql> source employees.sql  
Query OK, 0 rows affected (0.01 sec)  
  
Query OK, 0 rows affected (0.00 sec)  
  
Query OK, 0 rows affected (0.00 sec)  
  
Query OK, 0 rows affected (0.00 sec)  
  
Query OK, 0 rows affected (0.00 sec)  
  
Query OK, 0 rows affected (0.00 sec)  
  
Query OK, 0 rows affected (0.00 sec)
```

PG Program in Cloud Computing

```
ubuntu@ip-172-31-7-40: ~
Records: 24897 Duplicates: 0 Warnings: 0

Query OK, 24895 rows affected (0.19 sec)
Records: 24895 Duplicates: 0 Warnings: 0

Query OK, 24894 rows affected (0.19 sec)
Records: 24894 Duplicates: 0 Warnings: 0

Query OK, 24897 rows affected (0.18 sec)
Records: 24897 Duplicates: 0 Warnings: 0

Query OK, 24895 rows affected (0.19 sec)
Records: 24895 Duplicates: 0 Warnings: 0

Query OK, 24894 rows affected (0.20 sec)
Records: 24894 Duplicates: 0 Warnings: 0

Query OK, 24894 rows affected (0.24 sec)
Records: 24894 Duplicates: 0 Warnings: 0

Query OK, 24895 rows affected (0.19 sec)
Records: 24895 Duplicates: 0 Warnings: 0

Query OK, 24899 rows affected (0.20 sec)
Records: 24899 Duplicates: 0 Warnings: 0

Query OK, 24896 rows affected (0.19 sec)
Records: 24896 Duplicates: 0 Warnings: 0

|
```

```
mysql> describe employees;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| emp_no     | int(11)       | NO   | PRI | NULL    |       |
| birth_date | date          | NO   |     | NULL    |       |
| first_name  | varchar(14)   | NO   |     | NULL    |       |
| last_name   | varchar(16)   | NO   |     | NULL    |       |
| gender      | enum('M','F') | NO   |     | NULL    |       |
| hire_date   | date          | NO   |     | NULL    |       |
| password    | varchar(45)   | YES  |     | NULL    |       |
| email_id    | varchar(100)  | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
8 rows in set (0.01 sec)

mysql> |
```

PG Program in Cloud Computing

```

+-----+-----+-----+-----+
| Field | Type | Null | Key |
+-----+-----+-----+-----+
| emp_no | int(11) | NO | PRI |
| birth_date | date | NO | |
| first_name | varchar(14) | NO | |
| last_name | varchar(16) | NO | |
| gender | enum('M','F') | NO | |
| hire_date | date | NO | |
| password | varchar(45) | YES | |
| email_id | varchar(100) | YES | |
+-----+-----+-----+-----+
8 rows in set (0.01 sec)

mysql> exit
Bye
ubuntu@ip-172-31-7-40:~$

```

Python activity

```

This may mean that the package is missing, has been obsoleted, or
is only available from another source
However the following packages replace it:
python2-minimal

E: Package 'python-minimal' has no installation candidate
ubuntu@ip-172-31-7-40:~$ sudo apt install python2-minimal
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libpython2-stdlib libpython2.7-minimal libpython2.7-stdlib python2 python2.7 python2.7-minimal
Suggested packages:
  python2-doc python-tk python2.7-doc binutils binfmt-support
The following NEW packages will be installed:
  libpython2-stdlib libpython2.7-minimal libpython2.7-stdlib python2 python2-minimal python2.7
0 upgraded, 7 newly installed, 0 to remove and 87 not upgraded.
Need to get 3801 kB of archives.
After this operation, 16.4 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe amd64 libpython2.7-stdlib 2.7.18-0ubuntu0 [335 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe amd64 python2.7 2.7.18-0ubuntu0 [1270 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python2-minimal 2.7.18-0ubuntu0 [186 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe amd64 libpython2-stdlib 2.7.18-0ubuntu0 [186 kB]
43% [4 libpython2.7-stdlib 0 B/186 kB 0%]

```

PG Program in Cloud Computing

```
ubuntu@ip-172-31-7-40:~$ sudo apt install python3-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential cpp cpp-9 dpkg-dev fakeroot g
gcc-9-base libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan5 lib
libc-dev-bin libc6 libc6-dev libcc1-0 libcrypt-dev libctf-nobfd0 libctf0 libdpkg-perl libexpat1-
libfile-fcntllock-perl libgcc-9-dev libgomp1 libisl22 libitm1 liblsan0 libmpc3 libpython3-dev li
libquadmath0 libstdc++-9-dev libtsan0 libubsan1 linux-libc-dev make manpages-dev python-pip-whl
python3-wheel python3.8-dev zlib1g zlib1g-dev
Suggested packages:
  binutils-doc cpp-doc gcc-9-locales debian-keyring g++-multilib g++-9-multilib gcc-9-doc gcc-mult
automake libtool flex bison gdb gcc-doc gcc-9-multilib glibc-doc bzip libstdc++-9-doc make-doc
The following NEW packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential cpp cpp-9 dpkg-dev fakeroot g
gcc-9-base libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan5 lib
libc-dev-bin libc6-dev libcc1-0 libcrypt-dev libctf-nobfd0 libctf0 libdpkg-perl libexpat1-dev li
libfile-fcntllock-perl libgcc-9-dev libgomp1 libisl22 libitm1 liblsan0 libmpc3 libpython3-dev li
libquadmath0 libstdc++-9-dev libtsan0 libubsan1 linux-libc-dev make manpages-dev python-pip-whl
python3-pip python3-wheel python3.8-dev zlib1g-dev
The following packages will be upgraded:
  libc6 zlib1g
2 upgraded, 50 newly installed, 0 to remove and 85 not upgraded.
Need to get 49.5 MB of archives.
After this operation, 200 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

```
ubuntu@ip-172-31-7-40:~$ sudo pip3 install mysql-connector-python
Collecting mysql-connector-python
  Downloading mysql_connector_python-8.0.23-cp38-cp38-manylinux1_x86_64.whl (18.0 MB)
    | 18.0 MB 15.7 MB/s
Collecting protobuf>=3.0.0
  Downloading protobuf-3.14.0-cp38-cp38-manylinux1_x86_64.whl (1.0 MB)
    | 1.0 MB 37.1 MB/s
Requirement already satisfied: six>=1.9 in /usr/lib/python3/dist-packages (from protobuf>=3.0.0->
(1.14.0))
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.23 protobuf-3.14.0
ubuntu@ip-172-31-7-40:~$
```

```
ubuntu@ip-172-31-7-40:~$ sudo pip3 install pymysql
Collecting pymysql
  Downloading PyMySQL-1.0.2-py3-none-any.whl (43 kB)
    | 43 kB 390 kB/s
Installing collected packages: pymysql
Successfully installed pymysql-1.0.2
ubuntu@ip-172-31-7-40:~$
```


PG Program in Cloud Computing

```
ubuntu@ip-172-31-7-40:~$ wget https://storage.googleapis.com/skl-training/aws-codelabs/rds/rds.py
--2021-01-29 07:53:12-- https://storage.googleapis.com/skl-training/aws-codelabs/rds/rds.py
Resolving storage.googleapis.com (storage.googleapis.com)... 142.250.192.16, 142.250.192.144, 2404:6800:4009:
...
Connecting to storage.googleapis.com (storage.googleapis.com)|142.250.192.16|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1812 (1.8K) [text/x-python]
Saving to: 'rds.py'

rds.py          100%[=====] 1.77K  --.-KB/s

2021-01-29 07:53:12 (29.8 MB/s) - 'rds.py' saved [1812/1812]

ubuntu@ip-172-31-7-40:~$ ls
employees.sql  rds.py
ubuntu@ip-172-31-7-40:~$ |
```

Editing the rds.py with hostname, variable and table name

```
ubuntu@ip-172-31-7-40: ~  GNU nano 4.8  rds.py
*****
#Author - Nirmallya Mukherjee
#This script will connect to a MySQL DB using multiple driver options
*****
import pymysql
import mysql.connector

hostname = 'flipbasket.ciy0mdpdswpo.ap-south-1.rds.amazonaws.com'
#hostname = 'localhost'
username = 'root'
password = 'password'
database = 'employees'

# Simple routine to run a query on a database and print the results:
def doQuery(conn) :
    cur = conn.cursor()
    cur.execute("SELECT email_id FROM employees limit 10")
    for x in cur.fetchall() :
        print (x)

def pymysqlConnector() :
    print ("Using pymysql")
    print ("-----")
    myConnection = pymysql.connect(host=hostname, user=username, passwd=password)
    doQuery(myConnection)
    myConnection.close()

Save modified buffer?
Y Yes
N No      ^C Cancel
```

PG Program in Cloud Computing

```
ubuntu@ip-172-31-7-40:~$ nano rds.py
ubuntu@ip-172-31-7-40:~$ python3 rds.py
Using pymysql
-----
('georgi.facello@email.com',)
('bezalel.simmel@email.com',)
('parto.bamford@email.com',)
('chirstian.koblick@email.com',)
('koyoichi.maliniak@email.com',)
('anneke.preusig@email.com',)
('tzvetan.zielinski@email.com',)
('saniya.kalloufi@email.com',)
('sumant.peac@email.com',)
('duangkaew.piveteau@email.com',)

Using mysql.connector
-----
('georgi.facello@email.com',)
('bezalel.simmel@email.com',)
('parto.bamford@email.com',)
('chirstian.koblick@email.com',)
('koyoichi.maliniak@email.com',)
('anneke.preusig@email.com',)
('tzvetan.zielinski@email.com',)
('saniya.kalloufi@email.com',)
('sumant.peac@email.com',)
('duangkaew.piveteau@email.com',)

Using any of the above connectors, insert a new record in the orders table
ubuntu@ip-172-31-7-40:~$ |
```

PG Program in Cloud Computing

```

ubuntu@ip-172-31-7-40: ~
GNU nano 4.8                                rds.py
#*****
#Author - Nirmallya Mukherjee
#This script will connect to a MySQL DB using multiple driver options
#*****
import pymysql
import mysql.connector

hostname = 'flipbasket.ciy0mdpdswpo.ap-south-1.rds.amazonaws.com'
#hostname = 'localhost'
username = 'root'
password = 'password'
database = 'employees'

# Simple routine to run a query on a database and print the results:
def doQuery(conn) :
    cur = conn.cursor()
    cur.execute("SELECT email_id,emp_no,last_name FROM employees limit 10")
    for x,y,z in cur.fetchall() :
        print (x,y,z)

def pymysqlConnector() :
    print ("Using pymysql")
    print ("-----")
    myConnection = pymysql.connect(host=hostname, user=username, passwd=password, db=database)
    doQuery(myConnection)
    myConnection.close()

def mysqlConnector() :
    print ("\n\nUsing mysql.connector")
    print ("-----")
    [ Read 54 lines ]

^G Get Help      ^O Write Out     ^W Where Is      ^K Cut Text      ^J Justify       ^C Cur Pos       M-U Undo        M-A
^X Exit          ^R Read File     ^\ Replace       ^U Paste Text    ^T To Spell      ^_ Go To Line    M-E Redo        M-6

```

PG Program in Cloud Computing

```
ubuntu@ip-172-31-7-40: ~  
Last login: Fri Jan 29 07:43:32 2021 from 157.51.147.92  
ubuntu@ip-172-31-7-40:~$ nano rds.py  
ubuntu@ip-172-31-7-40:~$ python3 rds.py  
Using pymysql  
-----  
georgi.facello@email.com 10001 Facello  
bezalel.simmel@email.com 10002 Simmel  
parto.bamford@email.com 10003 Bamford  
chirstian.koblick@email.com 10004 Koblick  
kyoichi.maliniak@email.com 10005 Maliniak  
anneke.preusig@email.com 10006 Preusig  
tzvetan.zielinski@email.com 10007 Zielinski  
saniya.kalloufi@email.com 10008 Kalloufi  
sumant.peac@email.com 10009 Peac  
duangkaew.piveteau@email.com 10010 Piveteau  
  
Using mysql.connector  
-----  
georgi.facello@email.com 10001 Facello  
bezalel.simmel@email.com 10002 Simmel  
parto.bamford@email.com 10003 Bamford  
chirstian.koblick@email.com 10004 Koblick  
kyoichi.maliniak@email.com 10005 Maliniak  
anneke.preusig@email.com 10006 Preusig  
tzvetan.zielinski@email.com 10007 Zielinski  
saniya.kalloufi@email.com 10008 Kalloufi  
sumant.peac@email.com 10009 Peac  
duangkaew.piveteau@email.com 10010 Piveteau  
  
Using any of the above connectors, insert a new record in the orders table  
ubuntu@ip-172-31-7-40:~$ |
```