

Datos Generales:

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Este laboratorio se ha diseñado para reforzar el concepto de aprovechar una instancia de base de datos administrada por AWS con el objetivo de satisfacer las necesidades de una base de datos relacional.

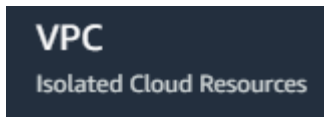
Después de completar este laboratorio, podrá realizar lo siguiente:

- Crear una instancia de RDS
- Utilizar Amazon RDS Query Editor para consultar datos.

Desafío

Antes de lanzar la instancia RDS es necesario crear un grupo de seguridad que permita conectarse a través de la instancia EC2.

Paso 1: AWS Management Console → Services → Networking & Content delivery → VPC



Paso 2: VPC → Panel de navegación → Security Groups → Create security group

▼ Security

Network ACLs

Security groups

Security Groups (3) Info						Refresh	Actions
<input type="text" value="Filter security groups"/>							
<input type="checkbox"/>	Name ▼	Security group ID ▼	Security group name ▼	VPC ID ▼	Description ▼		
<input type="checkbox"/>	Web Security Group	sg-0d078d02b5c3f73a9	Web Security Group	vpc-096080d6719e9cbff	Enable HTTP access		
<input type="checkbox"/>	–	sg-084099fa9976330ee	default	vpc-00404470d2b3a9a6e	default VPC security gr...		
<input type="checkbox"/>	–	sg-068d88c7e50201733	default	vpc-096080d6719e9cbff	default VPC security gr...		

Paso 3: Create security group → Basic details

- Security group name = DB Security group
- Description = Permit access from Web Security Group.
- VPC → Lab VPC

Basic details

Security group name [Info](#)

DB Security Group

Name cannot be edited after creation.

Description [Info](#)

Permit access from Web Security Group

VPC [Info](#)

Q |

vpc-096080d6719e9cbff (Lab VPC)
10.0.0.0/16

Paso 4: Create security group → Inbound rules

- Type → MySQL/Aurora (3306)
- Source → Escribir “sg” / Seleccionar “Web Security Group”

Inbound rules Info				Security Groups
Type Info	Protocol Info	Port range Info	Source Info	
MYSQL/Aurora ▼	TCP	3306	Custom ▼	Web Security Group sg-0d078d02b5c3f73a9 Web Security Group default sg-068d88c7e50201733
<button>Add rule</button>				Q sg X

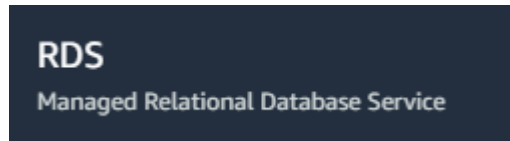
Se configuró el grupo de seguridad de base de datos para permitir el tráfico entrante en el puerto 3306 desde cualquier EC2 asociada al **Web Security Group**.

Paso 5: Create security group → Create

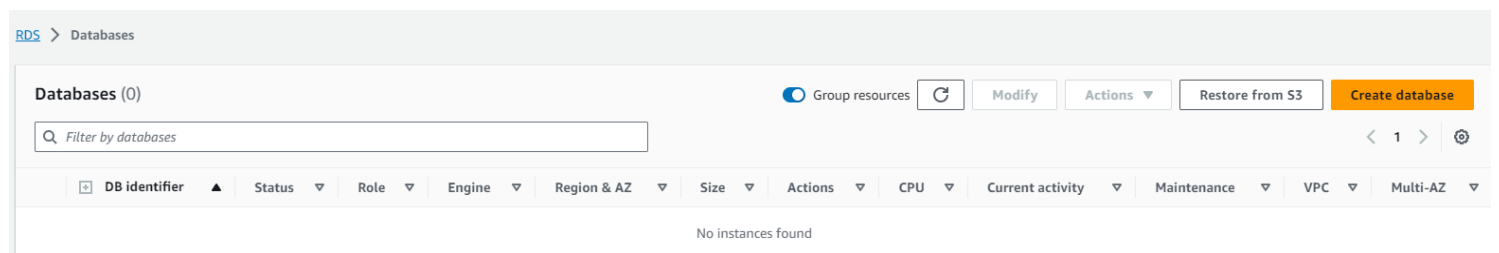
<button>Create security group</button>					
✓	DB Security Group	sg-03cb8b9ee498c3d26	DB Security Group	vpc-096080d6719e9cbff	Permit access from We...

Con el grupo de seguridad DB Security Group creado, ahora se procede a crear la instancia de base de datos Amazon RDS con motor MySQL.

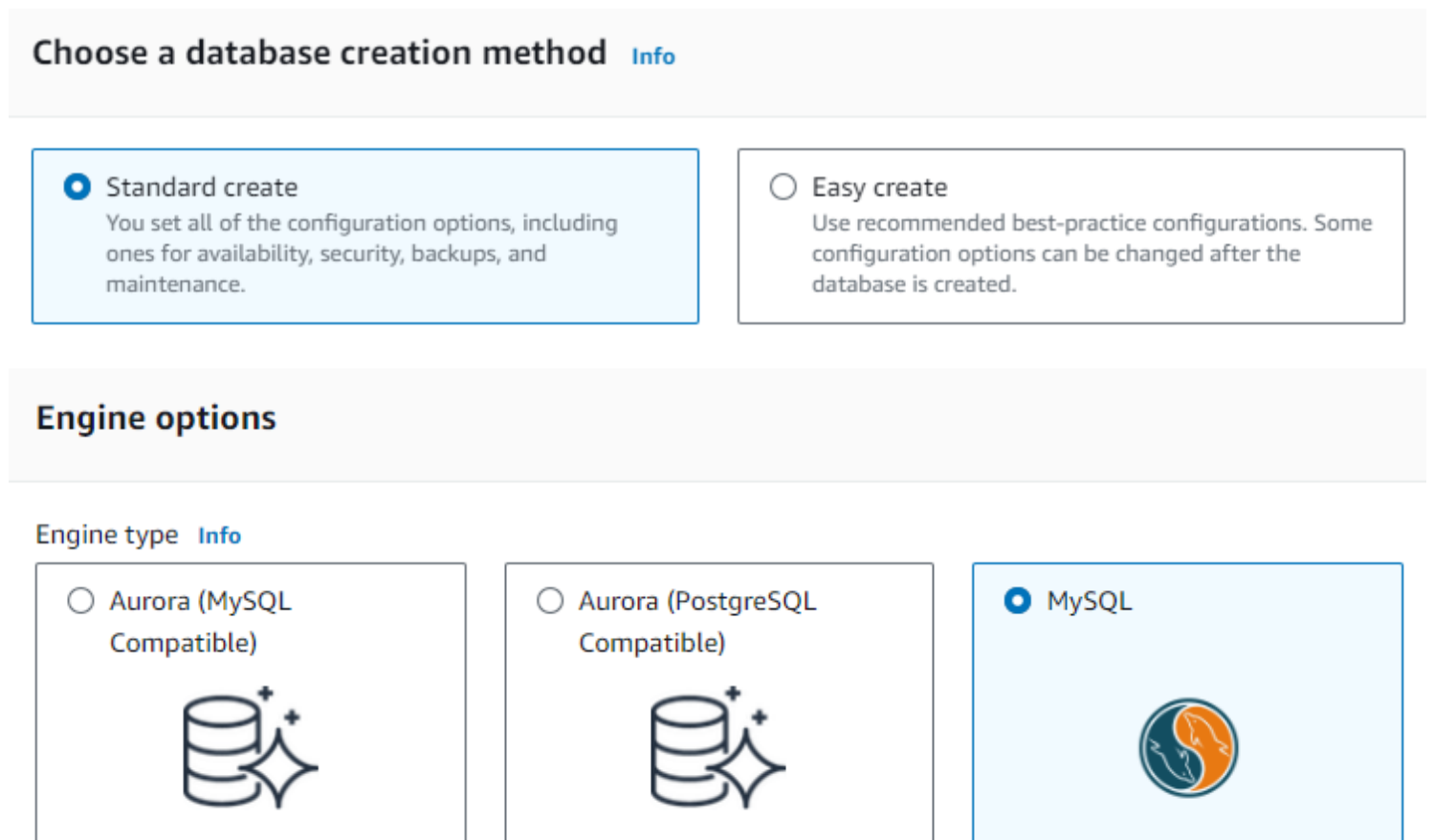
Paso 1: AWS Management → Services → Database → RDS



Paso 2: RDS → Panel de navegación → Databases → Create database



Paso 3: Create database → Configurar y Crear.



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. 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. The first character must be a letter.

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](#)

Username = admin

Password = admin123

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.



Amazon RDS Optimized Writes - *new* [Info](#)



Show instance classes that support Amazon RDS Optimized Writes

DB instance class [Info](#)

- ☐ 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



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 6144 GiB

Connectivity [Info](#)



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.

Lab VPC (vpc-0b61aa61d3abe436a)
4 Subnets, 2 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

Existing VPC security groups

Choose one or more options ▼

DB Security Group ✕

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**
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, backup turned off, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

Database options

Initial database name [Info](#)

Lab

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

DB parameter group [Info](#)

default.mysql8.0 ▼

Option group [Info](#)

default:mysql-8-0 ▼

Backup

☐ Enable automated backups

Creates a point-in-time snapshot of your database

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.

Paso 4: db-reto → Connectivity & Security → Copiar el link en el campo Endpoint.

db-reto.cqmctfzxtuju.us-west-2.rds.amazonaws.com

[RDS](#) > Databases

Databases (1)

Q Filter by databases

<input type="checkbox"/> DB identifier ▲	Status ▼	Role ▼	Engine ▼	Region & AZ ▼	Size ▼
db-reto	Creating	Instance	MySQL Community	us-west-2a	db.t2.micro

db-reto

Summary

DB identifier db-reto	CPU <div><div></div>6.50%</div>	Status Available
Role Instance	Current activity <div><div></div>0 Connections</div>	Engine MySQL Community

Connectivity & security

Monitoring

Logs & events

Configuration

Maintenance & backups

Tags

Connectivity & security

Endpoint & port Endpoint db-reto.cqmctfzxtuju.us-west-2.rds.amazonaws.com Port 3306	Networking Availability Zone us-west-2a VPC Lab VPC (vpc-0b61aa61d3abe436a)	Security VPC security groups DB Security Group (sg-00d00c527351b5bc0) Active Publicly accessible
---	---	--

Con la instancia RDS creada, ahora se debe proseguir conectandose a la instancia EC2 LinuxServer.

Paso 1: Conectarse a instancia EC2 LinuxServer mediante SSH.

- IP de LinuxSever se encuentra en Details del laboratorio (52.37.8.144).

Instances (1/1) Info

Find Instance by attribute or tag (case-sensitive)

<input checked="" type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check
<input checked="" type="checkbox"/>	Web Server 1	i-0aedb801a7f74680e	Running	t3.micro	2/2 checks passed

PuTTY Configuration

Category:

- Session
- Terminal
 - Logging
 - Keyboard
 - Bell
 - Features
- Window
 - Appearance
 - Behaviour
 - Translation
 - Selection
 - Colours
- Connection
 - Data
 - Proxy
 - SSH
 - Kex
 - Host keys
 - Cipher
 - Auth

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address)
Port

52.37.8.144
22

Connection type:

☒ SSH
☐ Serial
☐ Other:
Telnet

Load, save or delete a stored session

Saved Sessions

Default Settings

Load
Save
Delete

Close window on exit:

☐ Always
☐ Never
☒ Only on clean exit

About
Help
Open
Cancel

```
ec2-user@ip-10-0-2-116:~  
login as: ec2-user  
Authenticating with public key "imported-openssh-key"  
Last login: Tue Oct 10 01:05:15 2023 from 207.248.217.198  
  
#  
~\#### Amazon Linux 2  
~~\#####\  
~~\###| AL2 End of Life is 2025-06-30.  
~~\#/ \  
~~V~' '->  
~~~~  
~~~~ A newer version of Amazon Linux is available!  
~~~~  
~~~~ Amazon Linux 2023, GA and supported until 2028-03-15.  
~~~~ https://aws.amazon.com/linux/amazon-linux-2023/  
~/m/' /  
  
[ec2-user@ip-10-0-2-116 ~]$
```

Una vez conectados en la instancia EC2 LinuxServer es necesario configurarla para poder conectarse a la instancia RDS.

Paso 1: Instalar un cliente MySQL y utilizarlo para conectarse a su base de datos.

ec2-user@ip-10-0-2-116:~

```
[ec2-user@ip-10-0-2-116 ~]$ sudo yum install mariadb
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core
Resolving Dependencies
--> Running transaction check
--> Package mariadb.x86_64 1:5.5.68-1.amzn2.0.1 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                                Arch
=====
Installing:
mariadb                                x86_64

Transaction Summary
=====
Install 1 Package

Total download size: 8.8 M
Installed size: 49 M
Is this ok [y/d/N]: y
Downloading packages:
mariadb-5.5.68-1.amzn2.0.1.x86_64.rpm
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : 1:mariadb-5.5.68-1.amzn2.0.1.x86_64
  Verifying  : 1:mariadb-5.5.68-1.amzn2.0.1.x86_64

Installed:
  mariadb.x86_64 1:5.5.68-1.amzn2.0.1

Complete!
[ec2-user@ip-10-0-2-116 ~]$
```

```
[ec2-user@ip-10-0-2-116 ~]$ mysql --version
mysql Ver 15.1 Distrib 5.5.68-MariaDB, for Linux (x86_64) using readline 5.1
[ec2-user@ip-10-0-2-116 ~]$
```

ec2-user@ip-10-0-2-116:~

```
[ec2-user@ip-10-0-2-116 ~]$ mysql -h db-reto.cqmctfzxtuju.us-west-2.rds.amazonaws.com -P 3306 -u admin -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 19
Server version: 8.0.33 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MySQL [(none)]>
```

Ya conectados a la base de datos db-reto, proceder con los ejercicios planteados en el desafío.

Ejercicio 1: Crear una tabla **students** con las siguientes columnas:

- Student ID (Number)
- Student Name
- Restart City
- Graduation Date (Date Time)

```
MySQL [(none)]> CREATE DATABASE reto;  
Query OK, 1 row affected (0.01 sec)
```

```
MySQL [(none)]> USE reto;  
Database changed  
MySQL [reto]> █
```

```
CREATE TABLE students (  
    student_id INT NOT NULL AUTO_INCREMENT,  
    student_name VARCHAR(255) NOT NULL,  
    restart_city VARCHAR(255) NOT NULL,  
    graduation_date DATETIME NOT NULL,  
    PRIMARY KEY (student_id)  
);
```

```
MySQL [reto]> CREATE TABLE students (  
->     student_id INT NOT NULL AUTO_INCREMENT,  
->     student_name VARCHAR(255) NOT NULL,  
->     restart_city VARCHAR(255) NOT NULL,  
->     graduation_date DATETIME NOT NULL,  
->     PRIMARY KEY (student_id)  
-> );  
Query OK, 0 rows affected (0.03 sec)  
  
MySQL [reto]> █
```

Ejercicio 2: Insertar 10 filas de muestra en la tabla **students**

```
INSERT INTO students (student_name, restart_city, graduation_date) VALUES
('John Doe', 'New York City', '2024-05-31 00:00:00'),
('Jane Doe', 'Los Angeles', '2023-12-31 00:00:00'),
('Peter Parker', 'San Francisco', '2024-08-08 00:00:00'),
('Bruce Wayne', 'Gotham City', '2025-03-25 00:00:00'),
('Clark Kent', 'Smallville', '2026-06-18 00:00:00'),
('Diana Prince', 'Themyscira', '2027-09-11 00:00:00'),
('Arthur Curry', 'Atlantis', '2028-12-04 00:00:00'),
('Barry Allen', 'Central City', '2029-02-26 00:00:00'),
('Oliver Queen', 'Star City', '2030-05-19 00:00:00'),
('Kara Danvers', 'National City', '2031-08-12 00:00:00');
```

```
MySQL [reto]> INSERT INTO students (student_name, restart_city, graduation_date) VALUES
-> ('John Doe', 'New York City', '2024-05-31 00:00:00'),
-> ('Jane Doe', 'Los Angeles', '2023-12-31 00:00:00'),
-> ('Peter Parker', 'San Francisco', '2024-08-08 00:00:00'),
-> ('Bruce Wayne', 'Gotham City', '2025-03-25 00:00:00'),
-> ('Clark Kent', 'Smallville', '2026-06-18 00:00:00'),
-> ('Diana Prince', 'Themyscira', '2027-09-11 00:00:00'),
-> ('Arthur Curry', 'Atlantis', '2028-12-04 00:00:00'),
-> ('Barry Allen', 'Central City', '2029-02-26 00:00:00'),
-> ('Oliver Queen', 'Star City', '2030-05-19 00:00:00'),
-> ('Kara Danvers', 'National City', '2031-08-12 00:00:00');
Query OK, 10 rows affected (0.00 sec)
Records: 10  Duplicates: 0  Warnings: 0

MySQL [reto]>
```

Ejercicio 3: Seleccionar todas las filas de la tabla **students**

```
MySQL [reto]> SELECT * FROM reto.students;
+-----+-----+-----+-----+
| student_id | student_name | restart_city | graduation_date |
+-----+-----+-----+-----+
| 1 | John Doe | New York City | 2024-05-31 00:00:00 |
| 2 | Jane Doe | Los Angeles | 2023-12-31 00:00:00 |
| 3 | Peter Parker | San Francisco | 2024-08-08 00:00:00 |
| 4 | Bruce Wayne | Gotham City | 2025-03-25 00:00:00 |
| 5 | Clark Kent | Smallville | 2026-06-18 00:00:00 |
| 6 | Diana Prince | Themyscira | 2027-09-11 00:00:00 |
| 7 | Arthur Curry | Atlantis | 2028-12-04 00:00:00 |
| 8 | Barry Allen | Central City | 2029-02-26 00:00:00 |
| 9 | Oliver Queen | Star City | 2030-05-19 00:00:00 |
| 10 | Kara Danvers | National City | 2031-08-12 00:00:00 |
+-----+-----+-----+-----+
10 rows in set (0.00 sec)
```

Ejercicio 4: Crear una tabla **Cloud_Practitioner** con las siguientes columnas:

- Student ID (Number)
- Certification date (Date Time)

```
CREATE TABLE Cloud_Practitioner (  
  student_id INT NOT NULL AUTO_INCREMENT,  
  certification_date DATETIME NOT NULL,  
  PRIMARY KEY (student_id)  
);
```

```
MySQL [reto]> CREATE TABLE Cloud_Practitioner (  
->   student_id INT NOT NULL AUTO_INCREMENT,  
->   certification_date DATETIME NOT NULL,  
->   PRIMARY KEY (student_id)  
-> );  
Query OK, 0 rows affected (0.02 sec)  
  
MySQL [reto]> █
```

Ejercicio 5: Insertar 5 filas de muestra en la tabla **Cloud_Practitioner**.

```
INSERT INTO Cloud_Practitioner (certification_date) VALUES  
('2023-10-09 22:35:00'),  
('2023-10-09 22:36:00'),  
('2023-10-09 22:37:00'),  
('2023-10-09 22:38:00'),  
('2023-10-09 22:39:00');
```

```
MySQL [reto]> INSERT INTO Cloud_Practitioner (certification_date) VALUES  
->   ('2023-10-09 22:35:00'),  
->   ('2023-10-09 22:36:00'),  
->   ('2023-10-09 22:37:00'),  
->   ('2023-10-09 22:38:00'),  
->   ('2023-10-09 22:39:00');  
Query OK, 5 rows affected (0.00 sec)  
Records: 5  Duplicates: 0  Warnings: 0  
  
MySQL [reto]> █
```

Ejercicio 6: Seleccionar todas las filas de la tabla **Cloud_Practitioner**.

```
MySQL [reto]> SELECT * FROM reto.Cloud_Practitioner;
+-----+-----+
| student_id | certification_date |
+-----+-----+
|          1 | 2023-10-09 22:35:00 |
|          2 | 2023-10-09 22:36:00 |
|          3 | 2023-10-09 22:37:00 |
|          4 | 2023-10-09 22:38:00 |
|          5 | 2023-10-09 22:39:00 |
+-----+-----+
5 rows in set (0.00 sec)

MySQL [reto]> █
```

Ejercicio 7: Realizar un **Inner Join** de ambas tablas mostrando las columnas:

- Student ID, Student Name, Certification Date.

```
SELECT students.student_id, students.student_name, Cloud_Practitioner.certification_date
FROM students
INNER JOIN Cloud_Practitioner ON students.student_id = Cloud_Practitioner.student_id;
```

```
MySQL [reto]> SELECT students.student_id, students.student_name, Cloud_Practitioner.certification_date
-> FROM students
-> INNER JOIN Cloud_Practitioner ON students.student_id = Cloud_Practitioner.student_id;
+-----+-----+-----+
| student_id | student_name | certification_date |
+-----+-----+-----+
|          1 | John Doe     | 2023-10-09 22:35:00 |
|          2 | Jane Doe     | 2023-10-09 22:36:00 |
|          3 | Peter Parker | 2023-10-09 22:37:00 |
|          4 | Bruce Wayne  | 2023-10-09 22:38:00 |
|          5 | Clark Kent   | 2023-10-09 22:39:00 |
+-----+-----+-----+
5 rows in set (0.00 sec)

MySQL [reto]> █
```

A banner with a dark blue background featuring a network of glowing blue nodes and connecting lines. The text "Laboratorio Completado" is centered in a white, sans-serif font.

Laboratorio Completado