



SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY

Enterprise Standards and Best Practices for IT Infrastructure

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Name: Madanayake P.S.

SLIIT ID: IT13122492

Group Number:

Practical Session: WD

Practical Number: Lab 3

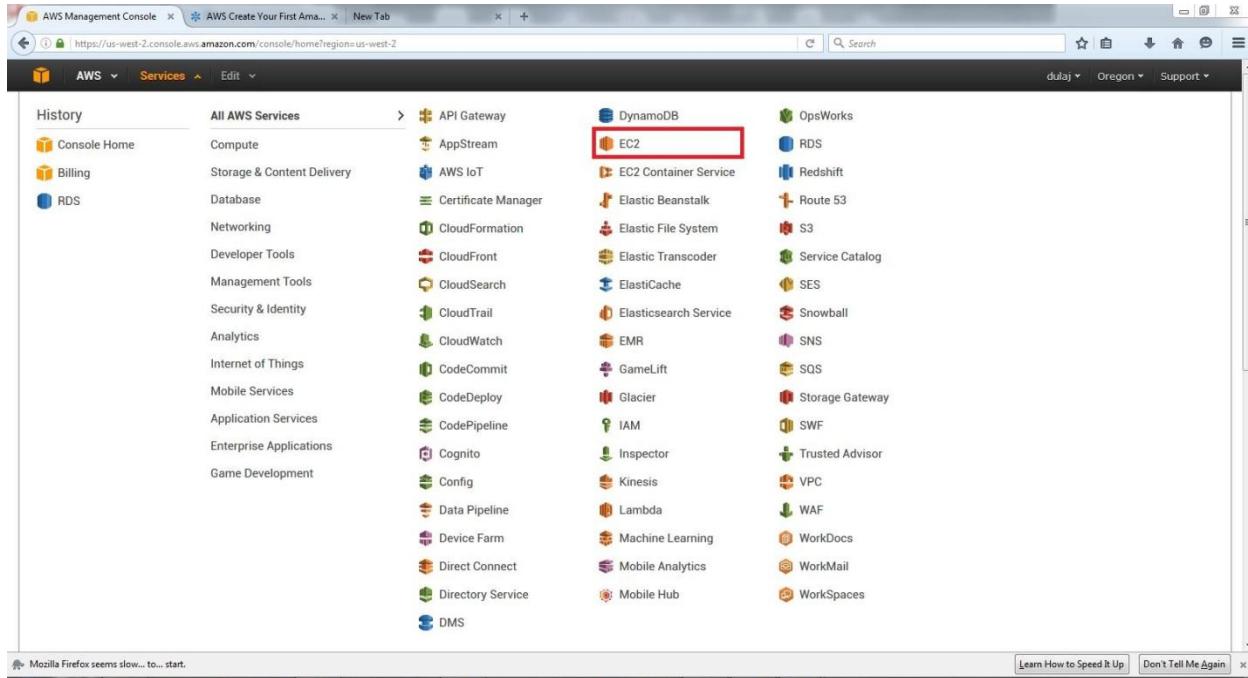
Date of Submission: 28-07-2016

Date of Evaluation : _____

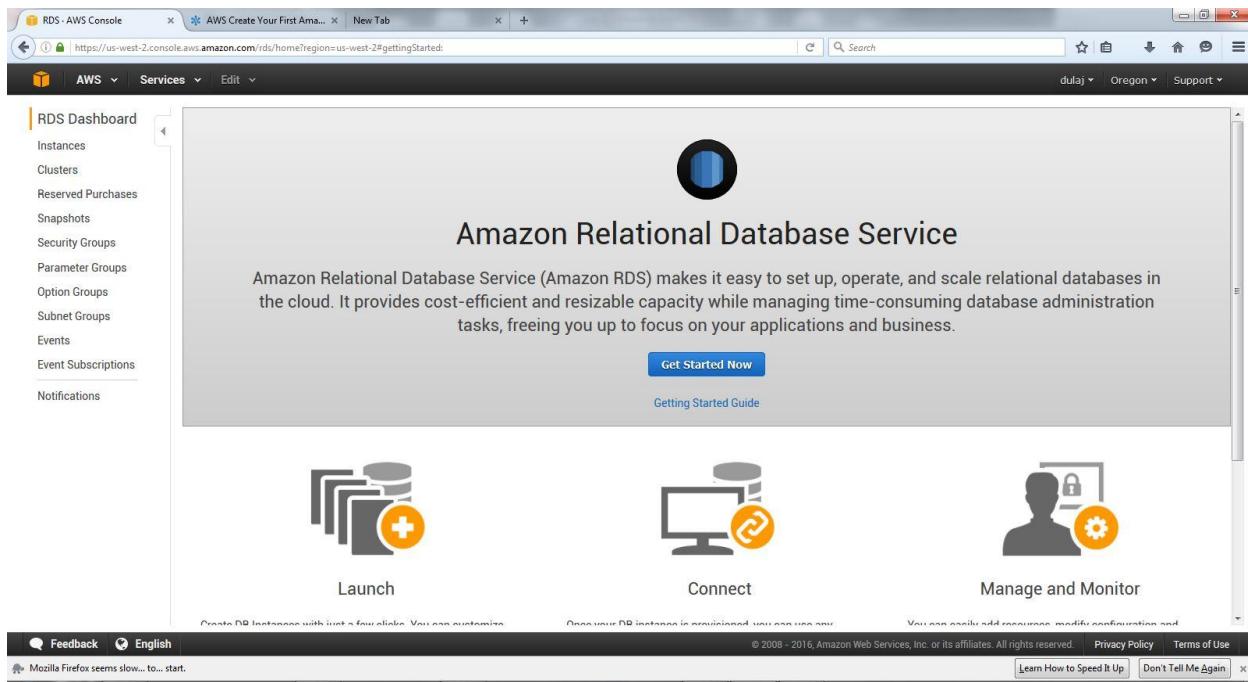
Evaluators Signature : _____

Step 1

On the console, click "RDS".



The following dashboard can be seen for the RDS.



Step 2

Before configuring the actual RDS instance, we need to create a “Subnet Group”. Subnet is an IP range that allows us to group our resources based on security and operational needs.

To create a subnet group, click “Subnet Groups” in the dashboard menu.

The screenshot shows the AWS RDS console homepage. The left sidebar menu is visible with the "Subnet Groups" option highlighted by a red box. The main content area features the Amazon Relational Database Service logo and a brief introduction. Below the introduction are three large icons: "Launch" (with a database cylinder icon), "Connect" (with a computer monitor icon), and "Manage and Monitor" (with a user profile and gear icon). At the bottom of the page, there are standard browser navigation and status bars.

Under the “Subnet groups”, click “Create DB Subnet Group”.

The screenshot shows the AWS RDS console with the "Subnet Groups" section selected in the sidebar. A red box highlights the "Create DB Subnet Group" button, which is located at the top of the main content area. The main content area displays a table titled "DB Subnet Groups" with one row: "No DB Subnet Groups". The table has columns for Name, Description, Status, and VPC. The bottom of the page includes a standard browser footer with links like "Feedback", "English", "Privacy Policy", and "Terms of Use".

Fill the required information as follows.

- **Name:** SliitLabs
- **Description:** lab 3 - RDS
- **VPC ID:** select the available one

The screenshot shows the 'Create DB Subnet Group' page in the AWS RDS console. The 'Name' field is set to 'SliitLabs', 'Description' to 'lab 3 - RDS', and 'VPC ID' to 'vpc-218cd45'. Below these fields, there's a section for adding subnets. A dropdown menu for 'Availability Zone' is open, showing 'us-west-2a' selected. An 'Add' button is visible next to the dropdown. The table below shows one row: 'None added'. At the bottom are 'Cancel' and 'Create' buttons.

Once you have entered the above information, add at least 2 subnets to the group.

The screenshot shows the same 'Create DB Subnet Group' page after adding a subnet. The 'Availability Zone' dropdown now shows 'us-west-2a' and 'us-west-2b' listed. The 'Subnet ID' dropdown shows 'subnet-43b7c627 (172.31.16.0/2)'. An 'Add' button is highlighted with a red box. The table below now shows two rows: 'us-west-2a' and 'us-west-2b'. The 'Create' button is visible at the bottom.

RDS - AWS Console AWS Services Edit Search dulaj Oregon Support

Create DB Subnet Group

To create a new Subnet Group give it a name, description, and select an existing VPC below. Once you select an existing VPC, you will be able to add subnets related to that VPC.

Name	SlitLabs
Description	Lab 3 - RDS
VPC ID	vpc-218dc45

Add Subnet(s) to this Subnet Group. You may add subnets one at a time below or [add all the subnets](#) related to this VPC. You may make additions/edits after this group is created. A minimum of 2 subnets is required.

Availability Zone	Subnet ID	CIDR Block	Action
us-west-2a	Subnet-43b7c627	172.31.16.0/20	Remove
us-west-2b	subnet-8efe76f8 (172.31.32.0/20)		Remove

[Cancel](#) [Create](#)

Now click “Create”.

After a few seconds the created subnet group will be available to be used.

RDS - AWS Console AWS Services Edit Search dulaj Oregon Support

Create DB Subnet Group

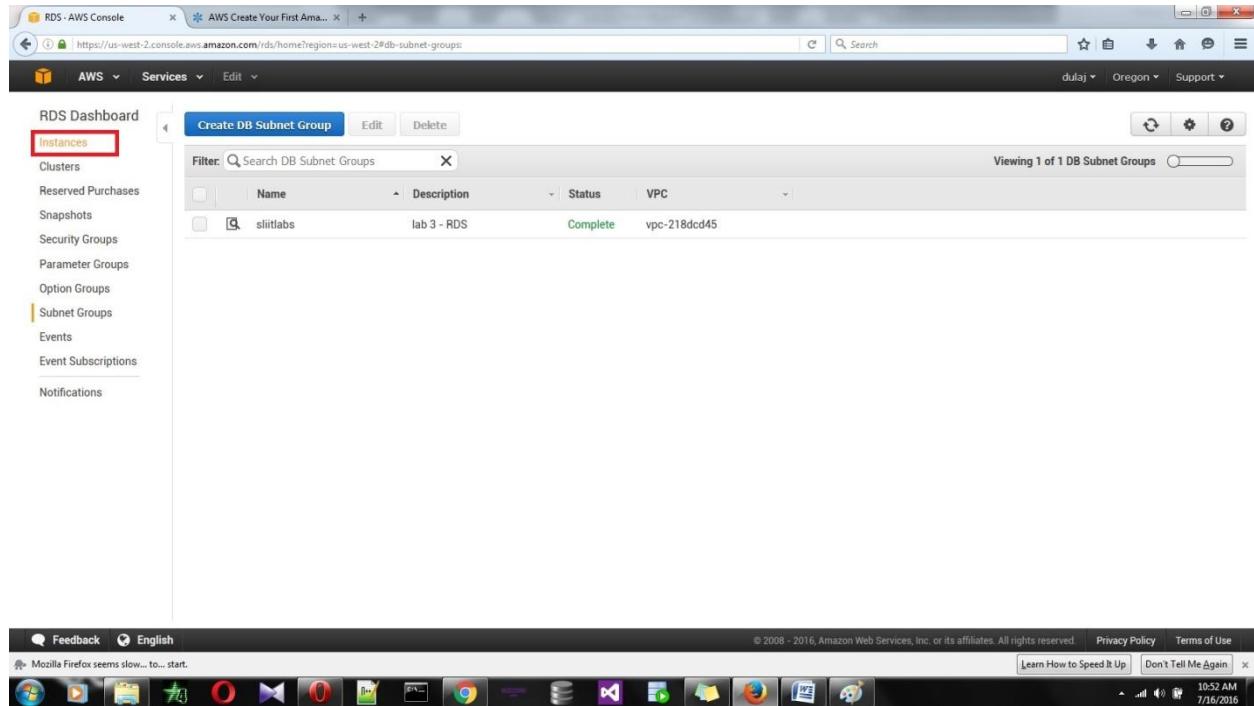
Filter: Search DB Subnet Groups Viewing 1 of 1 DB Subnet Groups

Name	Description	Status	VPC
slitlabs	lab 3 - RDS	Complete	vpc-218dc45

[Feedback](#) [English](#) Mozilla Firefox seems slow... to... start. © 2008 - 2016, Amazon Web Services, Inc. or its affiliates. All rights reserved. [Privacy Policy](#) [Terms of Use](#) [Learn How to Speed It Up](#) [Don't Tell Me Again](#)

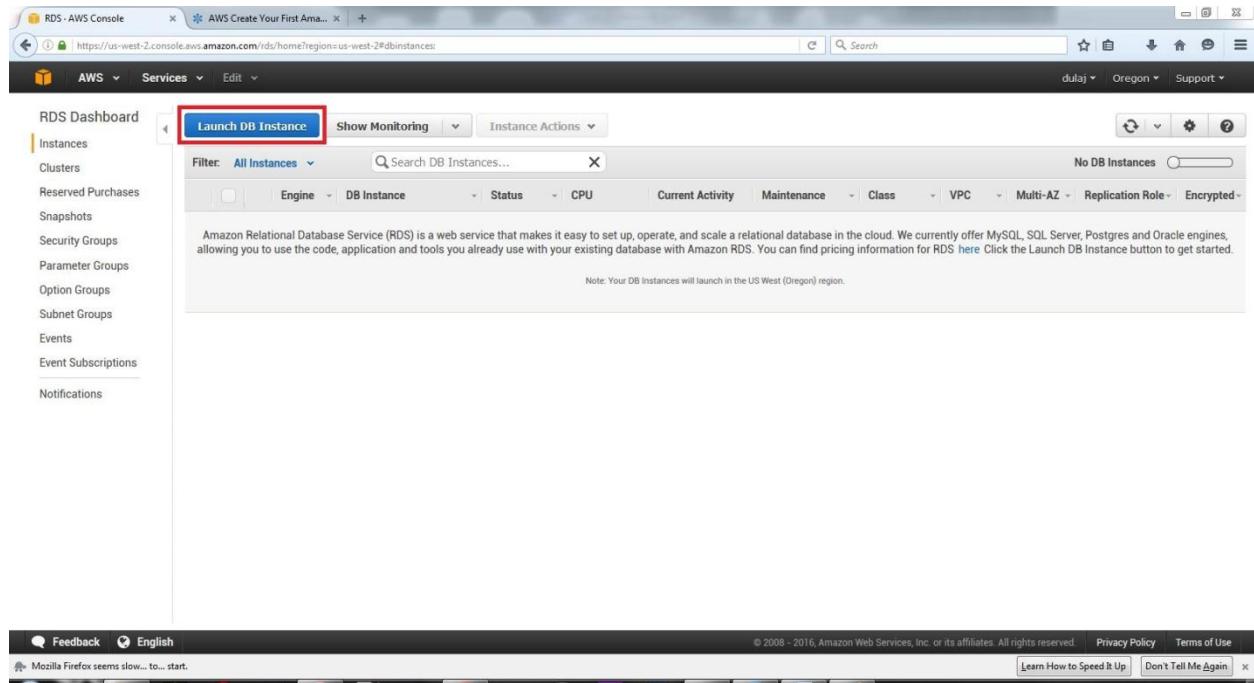
Step 3

Now that we have created a subnet group, lets create a RDS instance. Go to “Instances” in the RDS dashboard.



The screenshot shows the AWS RDS Dashboard. On the left, there's a sidebar with links like Instances, Clusters, Reserved Purchases, Snapshots, Security Groups, Parameter Groups, Option Groups, Subnet Groups, Events, Event Subscriptions, and Notifications. The 'Instances' link is highlighted with a red box. In the main content area, there's a 'Create DB Subnet Group' button and a table titled 'Filter: Search DB Subnet Groups'. The table has columns for Name, Description, Status, and VPC. It shows one entry: 'slitlabs' with 'lab 3 - RDS' description, 'Complete' status, and 'vpc-218ddc45' VPC. A message at the bottom says 'Viewing 1 of 1 DB Subnet Groups'.

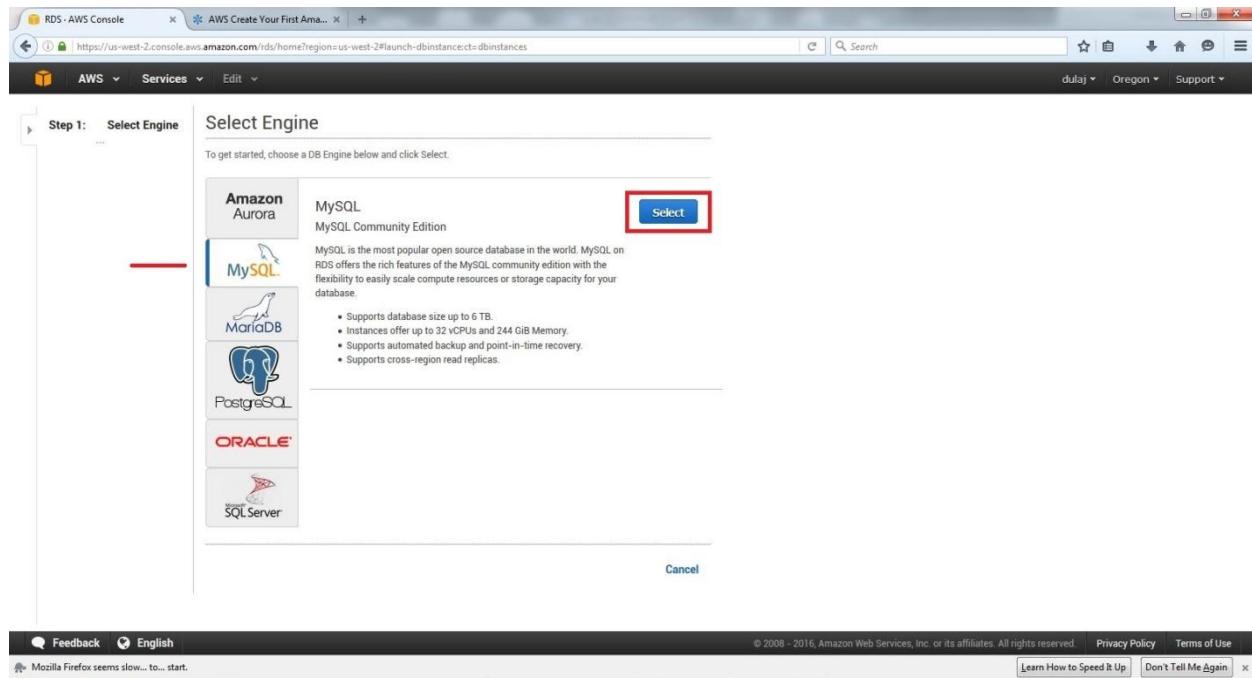
Click “Launch DB Instance”.



The screenshot shows the AWS RDS Dashboard. The sidebar is identical to the previous screenshot. In the main content area, there's a 'Launch DB Instance' button highlighted with a red box. Above the table, there are tabs for 'Show Monitoring' and 'Instance Actions'. The table below is titled 'Filter: All Instances' and has columns for Engine, DB Instance, Status, CPU, Current Activity, Maintenance, Class, VPC, Multi-AZ, Replication Role, and Encrypted. A note at the bottom of the table area says: 'Amazon Relational Database Service (RDS) is a web service that makes it easy to set up, operate, and scale a relational database in the cloud. We currently offer MySQL, SQL Server, Postgres and Oracle engines, allowing you to use the code, application and tools you already use with your existing database with Amazon RDS. You can find pricing information for RDS [here](#). Click the Launch DB Instance button to get started.' A note at the very bottom of the page says 'Note: Your DB Instances will launch in the US West (Oregon) region.'

Step 4

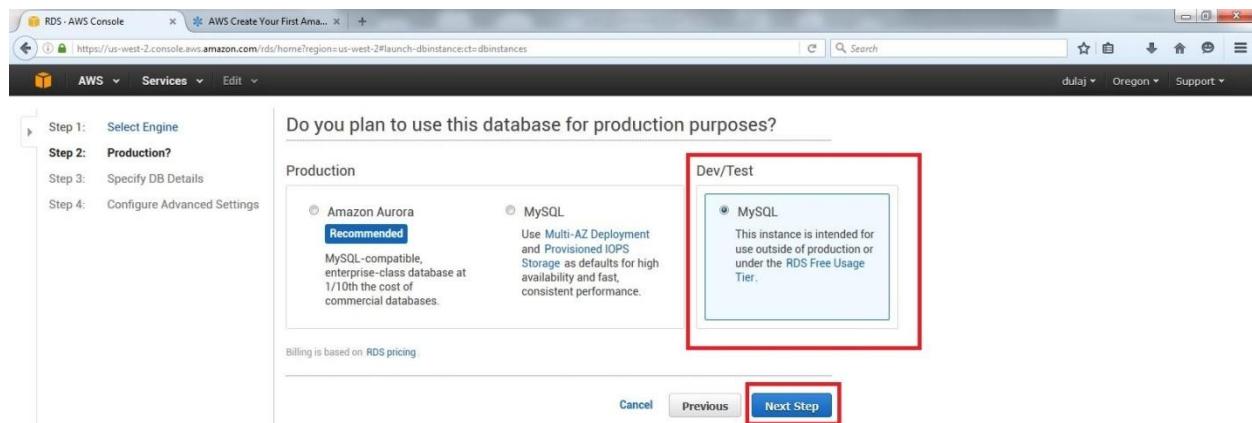
In the resulting form, we need to define the database engine. Here we use a MySQL database engine. Select “MySQL” and click “Select”.



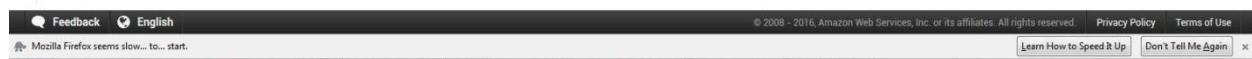
The screenshot shows the 'Select Engine' step of the AWS RDS creation wizard. On the left, a sidebar lists engines: Amazon Aurora, MySQL (selected), MariaDB, PostgreSQL, Oracle, and Microsoft SQL Server. The MySQL section contains a brief description and a bulleted list of features. A large blue 'Select' button is at the bottom right of this section, which is also highlighted with a red box. Below the MySQL section, there are 'Cancel' and 'Next Step' buttons.

Step 5

At the next form we will be asked whether the database would be used as a production database or not. Since we use this as a test, select “MySQL” under “Dev/Test” and click “Next Step”.



The screenshot shows the 'Production vs Dev/Test' step. It lists two options: 'Production' (Amazon Aurora, Recommended) and 'Dev/Test' (MySQL). The MySQL option is selected and highlighted with a red box. A detailed description of the MySQL instance is provided. At the bottom, there are 'Cancel', 'Previous', and 'Next Step' buttons, with 'Next Step' being highlighted with a red box.



Step 6

At the next step, we will be asked the basic configuration for the database instance. Provide the necessary information as follows.

The screenshot shows the 'Specify DB Details' step of the AWS RDS creation wizard. On the left, a sidebar lists steps: Step 1: Select Engine, Step 2: Production?, Step 3: Specify DB Details (highlighted in blue), Step 4: Configure Advanced Settings. The main area is titled 'Specify DB Details'. It includes a 'Free Tier' section with a note about the Amazon RDS Free Tier providing a single db.t2.micro instance up to 20 GB storage. A checkbox 'Only show options that are eligible for RDS Free Tier' is checked. Below this is the 'Instance Specifications' section, which includes fields for DB Engine (mysql), License Model (general-public-license), DB Engine Version (5.6.27), DB Instance Class (db.t2.micro — 1 vCPU, 1 GB RAM), Multi-AZ Deployment (No), Storage Type (General Purpose (SSD)), and Allocated Storage (5 GB). A warning message states: 'Provisioning less than 100 GB 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.' A link 'Click here' is provided for more details. To the right of the form, there is a callout with two bullet points: 'General Purpose (SSD)' (storage suitable for broad range of database workloads, baseline of 3 IOPS/GB, ability to burst to 3,000 IOPS) and 'Provisioned IOPS (SSD)' (storage suitable for I/O-intensive database workloads, provides flexibility to provision I/O). At the bottom of the page, there are links for Feedback, English, Mozilla Firefox speedup, Privacy Policy, Terms of Use, and a note about Mozilla Firefox being slow.

The screenshot shows the 'Specify DB Details' step of the AWS RDS creation wizard. The sidebar shows Step 3: Specify DB Details selected. The main area includes the 'Instance Specifications' section from the previous screenshot. Below it is the 'Settings' section, which contains fields for DB Instance Identifier (lab3-rds), Master Username (shanakatest), Master Password (*****), and Confirm Password (*****). A note says 'Retype the value you specified for Master Password.' At the bottom of the page, there are buttons for 'Cancel', 'Previous', and 'Next Step' (highlighted in red). The bottom of the screen has standard browser navigation and status bars.

Click "Next Step".

Step 7

After the basic instance configuration, we will be asked advanced configuration. Enter the following information.

Configure Advanced Settings

Network & Security

VPC* Default VPC (vpc-218dc45)
Subnet Group slitabs
Publicly Accessible No
Availability Zone us-west-2a
VPC Security Group(s) Create new Security Group default (VPC)

Database Options

Database Name
Note: if no database name is specified then no initial MySQL database will be created on the DB instance.
Database Port 3306
DB Parameter Group default.mysql5.6
Option Group default:mysql-5-6
Copy Tags To Snapshots Enable Encryption No

Select the DB parameter group that defines the configuration settings you want applied to this DB instance. [Learn More](#).

MySQL on Amazon RDS - ... AWS Create Your First Ama... +

Database Port 3306
DB Parameter Group default.mysql5.6
Option Group default:mysql-5-6
Copy Tags To Snapshots Enable Encryption No

Backup

Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to detail here.

Backup Retention Period 0 days

A backup retention period of zero days will disable automated backups for this DB instance.

Backup Window No Preference

Monitoring

Enable Enhanced Monitoring No

Maintenance

Auto Minor Version Upgrade Yes
Maintenance Window No Preference

* Required Cancel Previous Launch DB Instance

Click "Launch DB Instance".

After the successful creation of the instance, the following message can be seen.

The screenshot shows the 'AWS Create Your First Amazon RDS Instance' wizard. Step 4 is selected, which is 'Configure Advanced Settings'. A green box highlights the message: 'Your DB Instance is being created.' Below it, a note says: 'Note: Your instance may take a few minutes to launch.' At the bottom right of the main content area is a blue button labeled 'View Your DB Instances'.

By clicking "View Your DB Instances", we can see the DB instances that we have created.

The screenshot shows the AWS RDS Dashboard. On the left, there's a sidebar with various options like Instances, Clusters, Reserved Purchases, etc. The main area has tabs: 'Launch DB Instance', 'Show Monitoring', and 'Instance Actions'. A search bar at the top says 'Search DB Instances...'. Below it, a table displays one instance: 'MySQL' engine, 'lab3-rds' DB Instance, 'creating' status, 'None' current activity, 'db.t2.micro' class, 'vpc-218dc45' VPC, 'No' Multi-AZ, 'Replication Role' dropdown, and 'Encrypted' checkbox. The status 'creating' is highlighted in orange. At the bottom of the main content area is a blue button labeled 'View Your DB Instances'.

Here we can see the newly created instance's status as "Creating". For the instance to be available, it may take up to 10 minutes.

When the instance is available to use, the following can be seen.

The screenshot shows the AWS RDS Dashboard. On the left sidebar, under the 'Instances' section, there is a link to 'Launch DB Instance'. The main content area displays a table with one row for the MySQL instance 'lab3-rds'. The status column shows 'available'. Below the table, there is a monitoring section titled 'Monitoring' which includes a table of current system metrics: CPU (1.8%), Memory (551 MB), Storage (4,540 MB), Read IOPS (0.55/sec), Write IOPS (0.175/sec), and Swap Usage (0 MB). At the bottom of the dashboard, there are buttons for 'Instance Actions', 'Tags', and 'Logs'.

Step 8

In order to use the created RDS instance, we need to add an inbound rule to the VPC Security Group created during the RDS instance creation.

From the services, select “VPC” under “Networking”.

The screenshot shows the AWS Services menu. The 'Networking' option under 'All AWS Services' is highlighted with a red box. Other options listed include Compute, Storage & Content Delivery, Database, Developer Tools, Management Tools, Security & Identity, Analytics, Internet of Things, Mobile Services, Application Services, Enterprise Applications, and Game Development. To the right of the VPC section, there are links for Direct Connect and Route 53.

Now select “Security Groups” under the VPC Dashboard. The following page appears.

The screenshot shows the AWS VPC Management Console with the "Security Groups" tab selected. On the left, a sidebar lists various VPC-related services. The main area displays a table of security groups with the following data:

Name tag	Group ID	Group Name	VPC	Description
	sg-6d26550b	default	vpc-218dc45 (172.31.0.0/16)	default VPC security group
	sg-2cabd94a	rds-launch-wizard	vpc-218dc45 (172.31.0.0/16)	Created from the RDS Management Con...

Below the table, a message says "Select a security group above". The URL in the address bar is <https://us-west-2.console.aws.amazon.com/vpc/home?region=us-west-2#securityGroups>.

Click “rds-launch-wizard”.

On the “Inbound rules”, click “Edit”.

The screenshot shows the AWS VPC Management Console with the "Inbound Rules" tab selected for the "rds-launch-wizard" security group. A red box highlights the selected row in the table. The table shows one rule:

Type	Protocol	Port Range	Source
MySQL/Aurora (3306)	TCP (6)	3306	112.134.97.19/32

The "Edit" button is highlighted at the bottom of the table. The URL in the address bar is <https://us-west-2.console.aws.amazon.com/vpc/home?region=us-west-2#securityGroups>.

Change the “Source” to 172.31.0.0/16. Click “Save”.

The screenshot shows the AWS VPC Management Console. On the left, there's a sidebar with various VPC-related options like Virtual Private Cloud, Your VPCs, Subnets, Route Tables, Internet Gateways, DHCP Options Sets, Elastic IPs, Endpoints, NAT Gateways, and Peering Connections. Below that is a section for Security Groups, which is currently selected. The main area shows a table of existing security groups:

Name tag	Group ID	Group Name	VPC	Description
sg-6d26550b	default	vpc-218ddc45 (172.31.0.0/16)	default VPC security group	
sg-2cabd94a	rds-launch-wizard	vpc-218ddc45 (172.31.0.0/16)	Created from the RDS Management Con...	

Below the table, there's a form for creating a new security group. The 'Summary' tab is selected. A red box highlights the 'Save' button. The 'Inbound Rules' tab is also visible.

Step 9

Lets try connecting to the MySQL instance that we have created. Type the following command in the format,

```
mysql -h <endpoint> -P 3306 -u <mymasteruser> -p
```

The screenshot shows a Microsoft Windows Command Prompt window. The title bar says 'Command Prompt'. The window displays the following text:

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\shanaka>mysql -h lab3-rds.czhyduxgqiyn.us-west-2.rds.amazonaws.com -p 3
306 -u shanakatest -p
Enter password: *****
ERROR 2003 (HY000): Can't connect to MySQL server on 'lab3-rds.czhyduxgqiyn.us-w
est-2.rds.amazonaws.com' (10060)

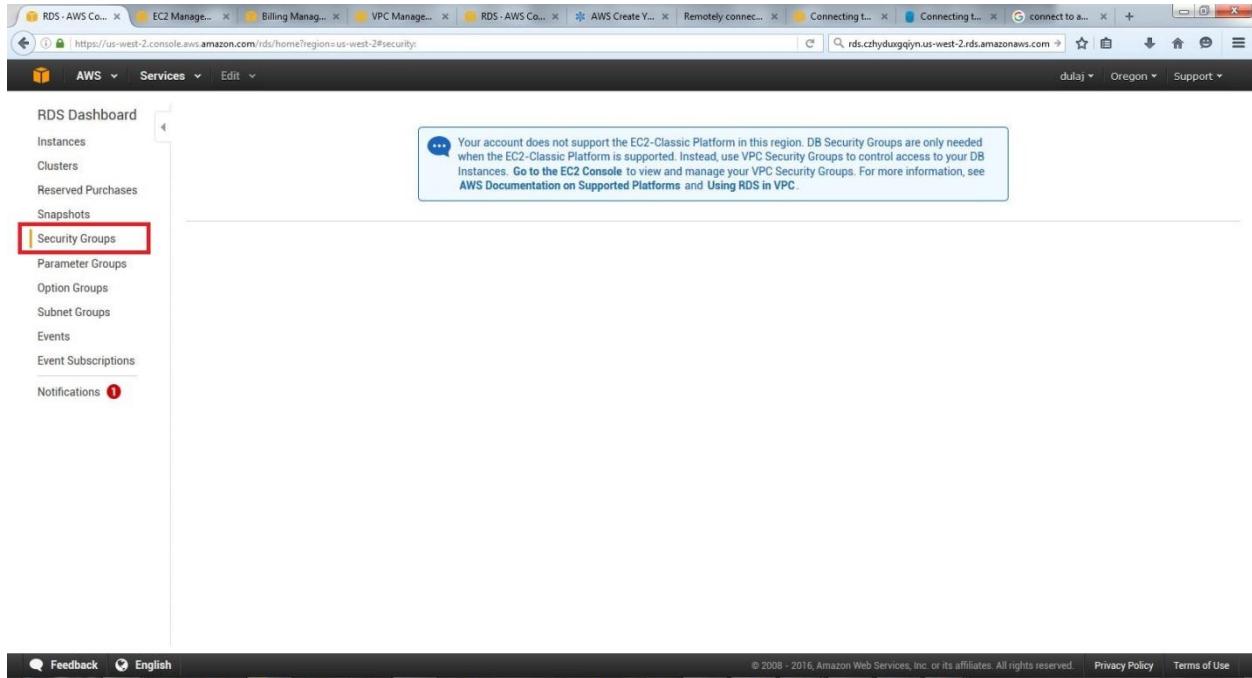
C:\Users\shanaka>
```

Here we got an error indicating a failure trying to connect to the MySQL instance.

The solution for this error is that we need to create a Security Group.

Step 10

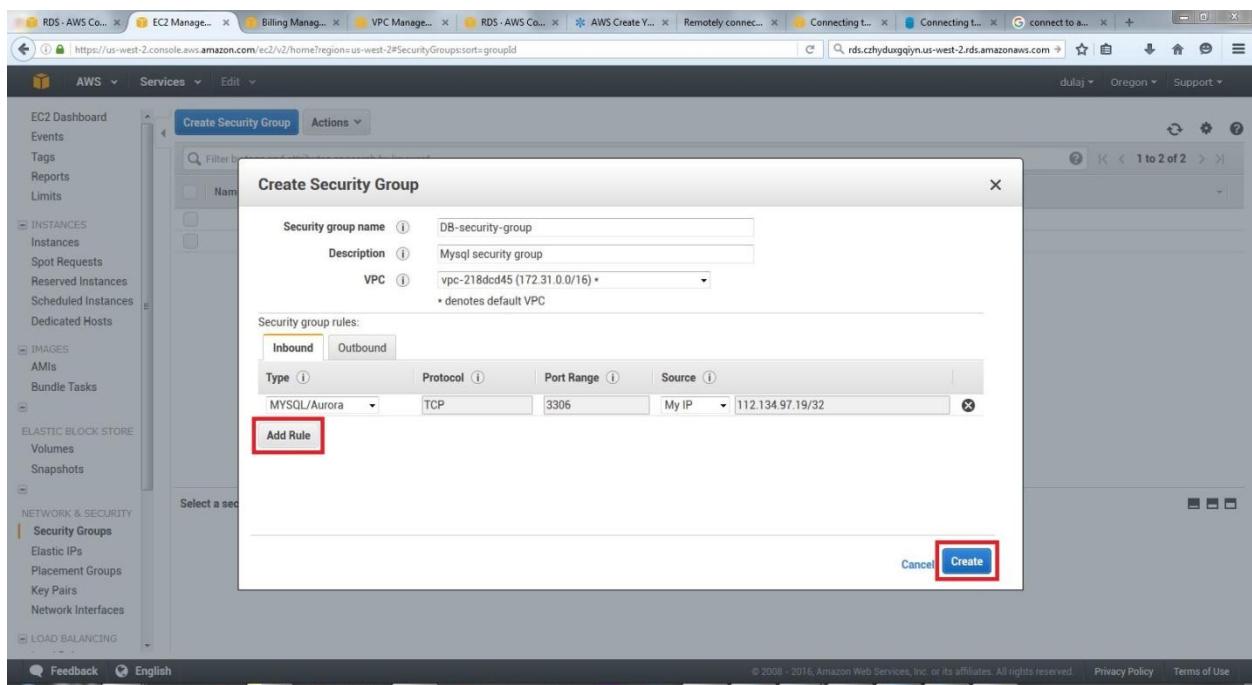
Lets create a security group from “Security Groups” under RDS panel. Click “Go to The EC2 Console”.



Click “Create Security Group”. Enter the required information.

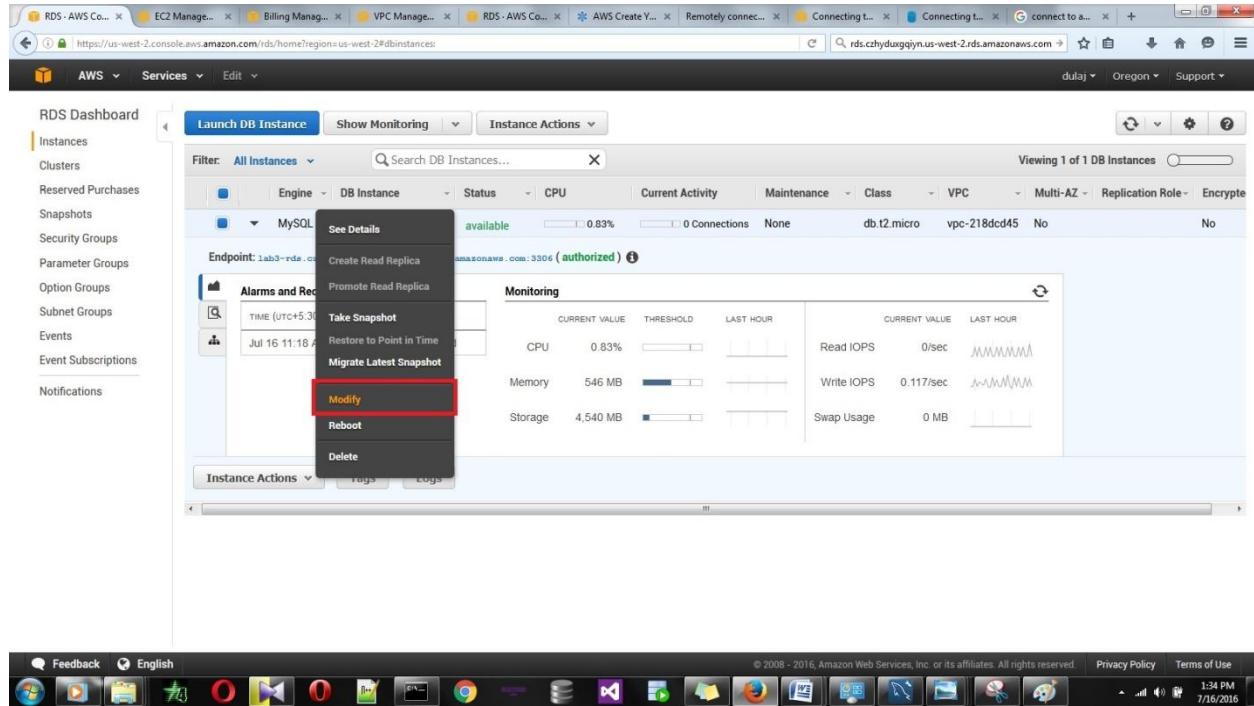
NOTE: make sure to select the correct VPS we defined for the RDS instance creation.

Click “Add Rule”. Select “MySQL” as the type and the IP address for the source. Click “Create”.

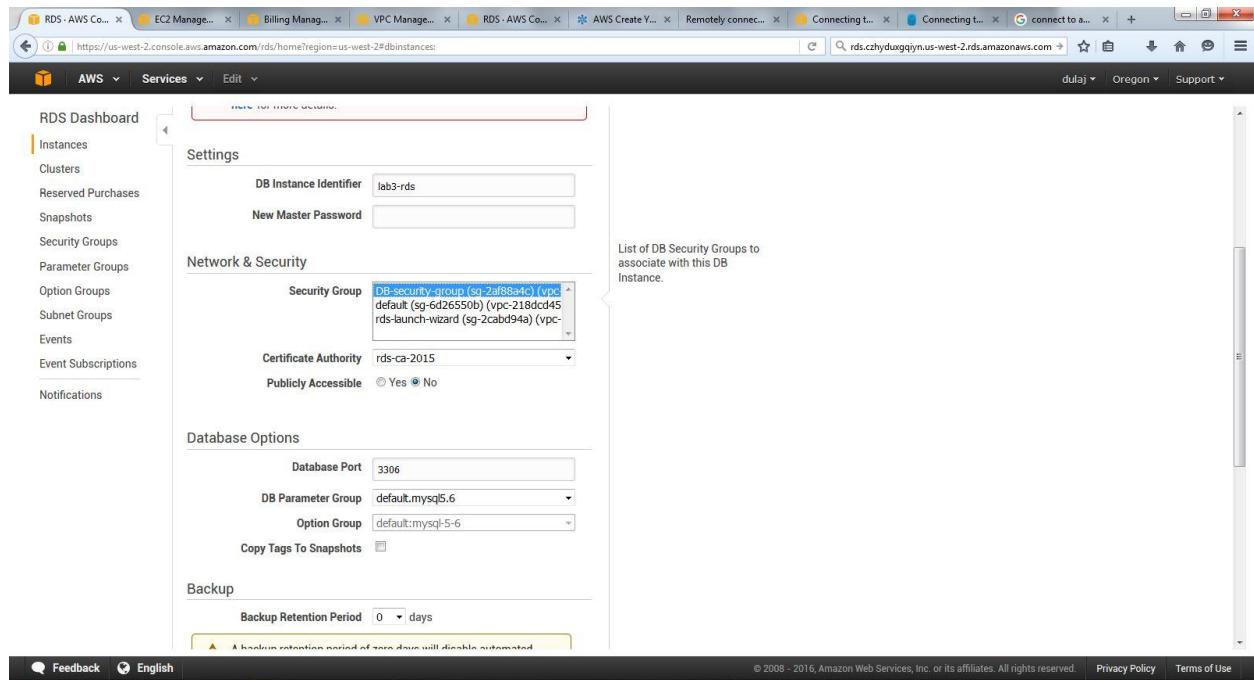


Step 11

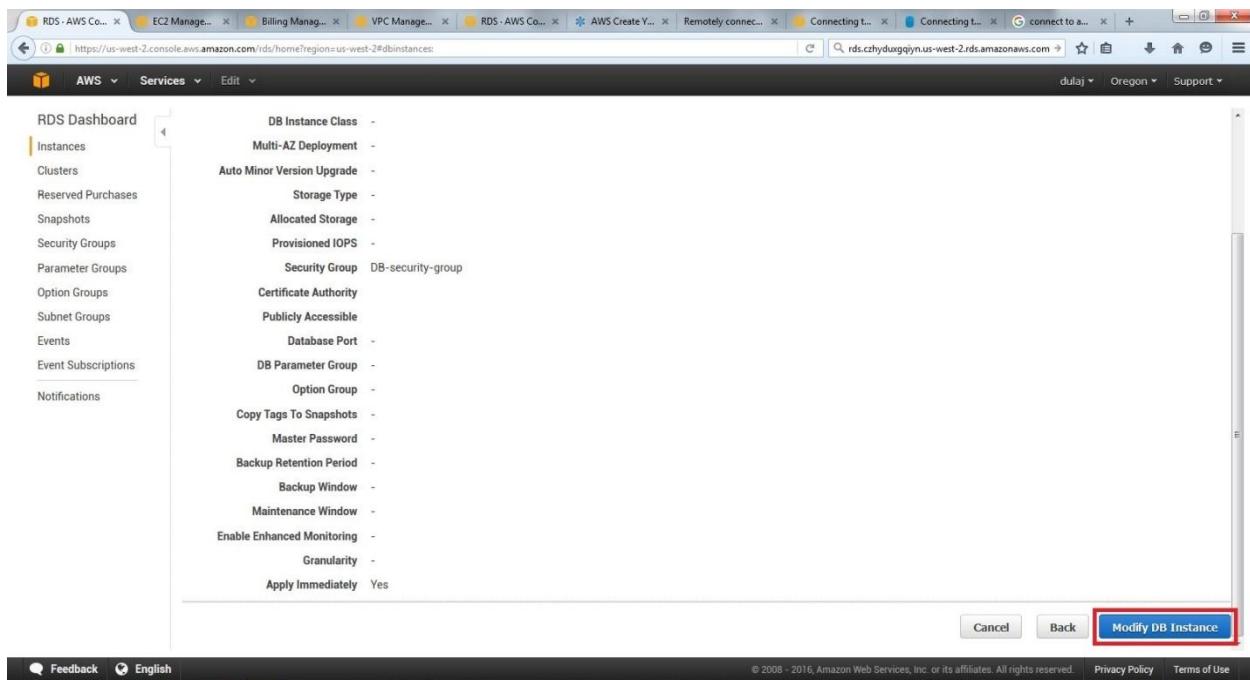
Now go to the RDS instance we created, right click the instance and click "Modify".



Now select the new Security Group we have created in "Security Group" under "Network & Security".



Check "Apply Immediately" and click "Continue".



Click "Modify DB Instance".

Step 12

Lets connect again to the MySQL database instance.

```
Command Prompt - mysql -h lab3-rds.czhyduxgqiyn.us-west-2.rds.amazonaws.com -u shanakates...  
Microsoft Windows [Version 6.1.7601]  
Copyright <c> 2009 Microsoft Corporation. All rights reserved.  
C:\Users\shanaka>mysql -h lab3-rds.czhyduxgqiyn.us-west-2.rds.amazonaws.com -u shanakatest -p  
Enter password: *****  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 57  
Server version: 5.6.27 MySQL Community Server (GPL)  
Copyright <c> 2000, 2016, 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> show databases;  
+-----+  
| Database |  
+-----+  
| information_schema |  
| innodb |  
| mysql |  
| performance_schema |  
| sys |  
+-----+  
5 rows in set (0.32 sec)  
mysql>
```

Step 13

Lets test the created database by creating a database and adding some records to it.

```
Command Prompt - mysql -h lab3-rds.czhyduxgqiy.us-west-2.rds.amazonaws.com -u shanakates...
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> show databases;
+-----+
| Database |
+-----+
| information_schema |
| innodb |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.32 sec)

mysql> create database mydb;
ERROR 2006 (HY000): MySQL server has gone away
No connection. Trying to reconnect...
Connection id: 85
Current database: *** NONE ***

Query OK, 1 row affected (2.11 sec)

mysql> use mydb;
Database changed
mysql> create table Users
    -> (
    ->     id int,
    ->     name varchar(30)
    -> );
Query OK, 0 rows affected (0.33 sec)

mysql> insert into Users(id, name) values(1, 'Shanaka');
Query OK, 1 row affected (0.31 sec)

mysql> insert into Users(id, name) values(2, 'Lahiru');
Query OK, 1 row affected (0.31 sec)

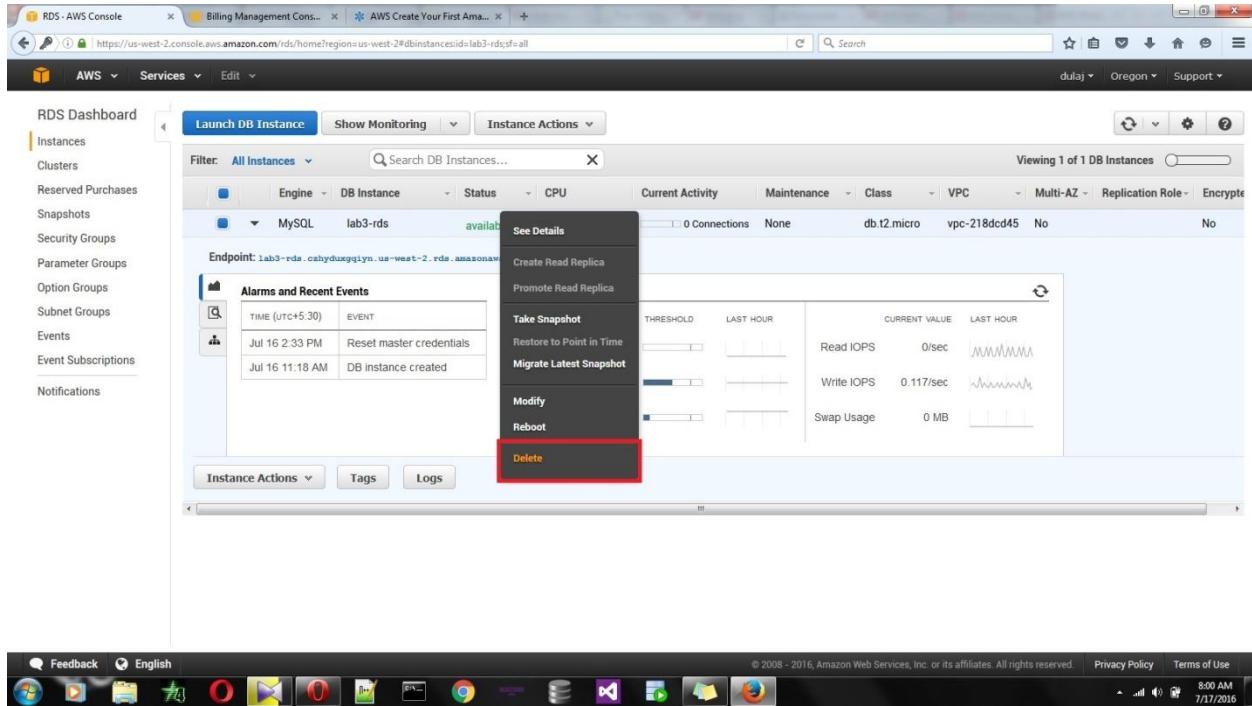
mysql> insert into Users(id, name) values(2, 'Nadun');
Query OK, 1 row affected (0.31 sec)

mysql> select * from Users;
+---+---+
| id | name |
+---+---+
| 1 | Shanaka |
| 2 | Lahiru |
| 2 | Nadun |
+---+---+
3 rows in set (0.31 sec)

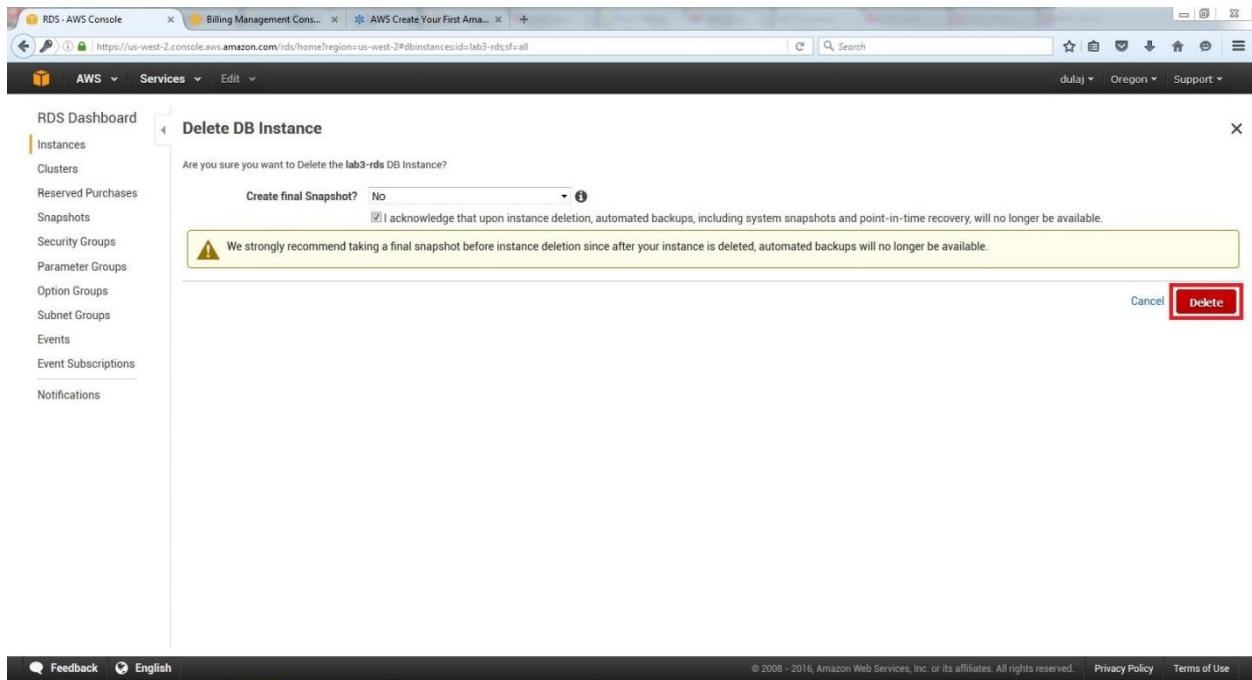
mysql>
```

Step 14

To remove the RDS instance, right click on the instance and click “Delete”.



You will need to confirm the deletion of the instance. Click “Delete” on “Delete DB Instance”.



Under instance tab, you can see the “Status” of the instance as “*deleting*”.

Screenshot of the AWS RDS Console showing the status of a MySQL database instance named "lab3-rds". The status is highlighted with a red box and shows "deleting".

The screenshot shows the AWS RDS Dashboard with the following details:

- Instances**: MySQL, lab3-rds
- Status**: deleting
- Engine**: MySQL
- DB Instance**: lab3-rds
- CPU**: 1.00%
- Current Activity**: 0 Connections
- Maintenance**: None
- Class**: db.t2.micro
- VPC**: vpc-218dc45
- Multi-AZ**: No
- Replication Role**: No
- Encryption**: No

Below the main table, there are two sections: "Alarms and Recent Events" and "Monitoring".

Alarms and Recent Events table:

TIME (UTC+5:30)	EVENT
JUL 16 2:33 PM	Reset master credentials
JUL 16 11:18 AM	DB instance created

Monitoring section:

	CURRENT VALUE	THRESHOLD	LAST HOUR		CURRENT VALUE	LAST HOUR
CPU	0.915%	[progress bar]	[graph]	Read IOPS	0/sec	[graph]
Memory	542 MB	[progress bar]	[graph]	Write IOPS	0.5/sec	[graph]
Storage	4,540 MB	[progress bar]	[graph]	Swap Usage	0 MB	[graph]

End of Assignment 3