



Training and
Certification

Amazon RDS Lab

AWS Essentials

Version 3.1

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Introduction

Overview

Amazon Relational Database Service (Amazon RDS) is a web service that makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while managing time-consuming database administration tasks, freeing you up to focus on your applications and business.

Amazon RDS gives you access to the capabilities of a familiar MySQL, Oracle or Microsoft SQL Server database engine. This means that the code, applications, and tools you already use today with your existing databases can be used with Amazon RDS. Amazon RDS automatically patches the database software and backs up your database, storing the backups for a user-defined retention period and enabling point-in-time recovery. You benefit from the flexibility of being able to scale the compute resources or storage capacity associated with your Database Instance (DB Instance) via a single API call. Please review http://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/CHAP_GettingStarted.html for further information about Amazon AWS RDS features.

Topics Covered

The following Amazon RDS topics are covered in this lab:

- Overview of the RDS Management Console
- Creating and modifying Security Groups
- Launching a MySQL instance
- Connecting to and utilizing the MySQL instance
- Working with and adjusting the database

The Scenario

As the operations focused individual in the start-up business, Asperatus Tech, you are tasked with coming up with a low cost, high availability solution for your customer facing website. Your website will host a myriad of documents for your customers, as well as video and static content. A distributed workforce will iterate upon the content. You have reached the final step in this process, configuring a relational database using RDS.

Using Amazon RDS

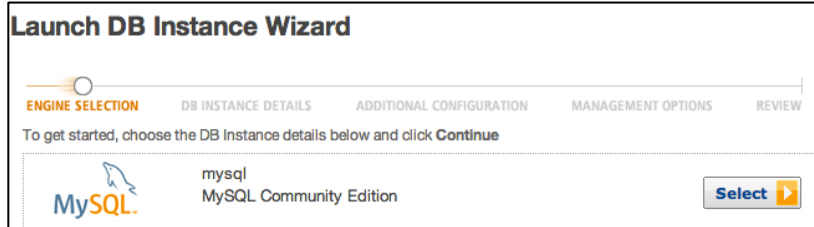
The AWS Management Console

Please review the instructions included within the first lab for opening and configuring the console.

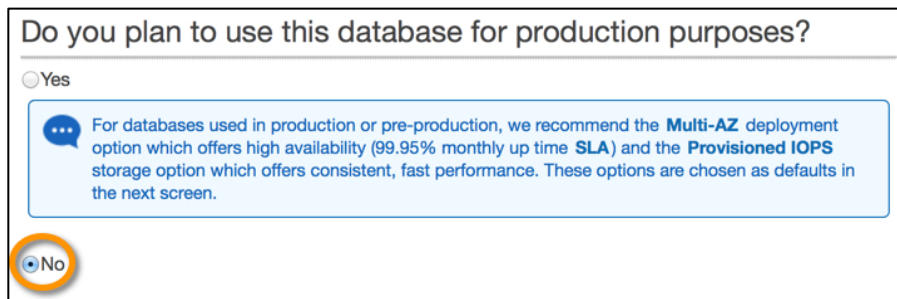
Amazon RDS Basics

You will now tackle managing Asperatus Tech data within a relational database. In this section, you will create and modify security groups, launch an instance, and learn about the RDS Management Console.

1. Click the **RDS** link to open the RDS Management Console.
2. Click **Launch a DB Instance**.
3. On the “Engine Selection” panel, choose the **MySQL** instance and click **Select**.



4. Choose **No** to the question “Do you plan to use this instance for production?” This option enables multi-az deployment and for the lab is not necessary. You would want to review this for your own organization. Click **Next Step**.



- 5.
6. On the “DB Instance Details” panel, type or choose the following:
 - (1) For **DB Instance Class**, choose **db.t1.micro**.
 - (2) For **Multi-AZ Deployment**, choose **No**.
 - (3) For **Allocated Storage**, type **5** (GB).
 - (4) For **DB Instance Identifier**, type a name such as **AsperatusProductionDB**.
 - (5) For **Master Username** and **Master Password** type values such as **AsperatusDBA** and **password**.
 - (6) Accept the remaining default values and click **Next Step**.

To get started, choose a DB engine below and click **Continue**

DB Engine: mysql
License Model: General Public License
DB Engine Version: MySQL 5.6.12 (default)
DB Instance Class: db.t1.micro **1**
Multi-AZ Deployment: No **2**
Auto Minor Version Upgrade: ☒ Yes ☐ No

Provide the details for your RDS Database Instance.

Allocated Storage:* 5 **3** (Minimum: 5 GB, Maximum: 3072 GB)
 GB improve IOPS performance.
Use Provisioned IOPS: ☐ **4**
DB Instance Identifier:* AsperatusProductionDB (e.g., dbinstance)
Master Username:* AsperatusDBA (e.g., user)
Master Password:* **5** (password)

7. On the “Additional Configuration” panel, type or choose the following:

- (1)** For **Database Name**, type a value such as **AsperatusProductionDB**.
- (2)** For **Publicly Accessible**, tick **No**.
- (3)** For **DB Security Group(s)**, select the group containing the text *qlstack* in its name.
- (4)** Accept the remaining default values and click **Next Step**.

Additional Config

Provide the optional additional configuration details below.

Database Name: AsperatusProductionDB (e.g. mydb) **1**
Note: if no database name is specified then no initial MySQL database will be created on the DB Instance.

Database Port: 3306
Choose a VPC: Default VPC (vpc-e65e0d8d)
DB Subnet Group: default
Publicly Accessible: ☐ Yes ☒ No **2**
Availability Zone: No Preference
Option Group: default:mysql-5-6

If you have custom DB Parameter Groups or DB Security Groups you would like to associate with this DB Instance, select them below, otherwise proceed with default settings.

Parameter Group: default.mysql5.6
VPC Security Group(s): qlstack2-lab-78-138357879... **3**
 default (VPC)

- 8. Make note of the options available for backups on the “Management Options” panel, tick **Yes** for **Enabled Automatic Backups** and click **Next Step**.
- 9. Review your options on the “Review” panel and then click **Launch DB Instance**. After a short time, you will have a functional MySQL relational database server.
- 10. Click the link **View your DB instances on the DB Instances page** to return to the RDS instances page.

11. You will need to allow connections to the MySQL port, 3306, in order for your Windows server instances to connect to the database. To do so:

- (1) Go to **EC2 > Network & Security > Security Groups**
- (2) Tick the security group containing *qlstack* in its name
- (3) Choose **Inbound** in the lower panel and choose **MYSQL** for the new rule
- (4) Validate **0.0.0.0/0** is present as source. If not, add it.
- (5) Click **Add Rule** then **Apply Rule Changes**

EC2 Dashboard
Events
Tags

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Create Security Group Delete

Viewing: All Security Groups Search

	Group ID	Name
<input checked="" type="checkbox"/>	sg-2eb7bc4c	qlstack2-lab-78-1383578794-Ec2Secu
<input type="checkbox"/>	sg-72e9191d	default

1 Security Group selected

Security Group: qlstack2-lab-78-1383578

Details Inbound Outbound

Create a new rule: MYSQL

Source: 0.0.0.0/0
(e.g., 192.168.2.0/24, sg-47ad482e, or 1234567890/default)

Add Rule

Apply Rule Changes

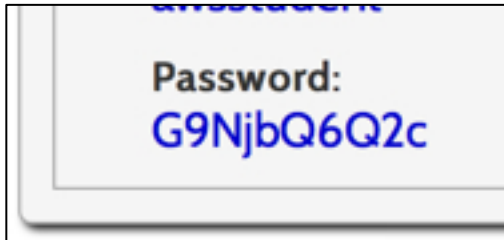
Using RDS

As an Asperatus engineer, you will likely need to have operational knowledge of connectivity to the relational database (RDS) for troubleshooting purposes. In this section, you learn how to connect to the MySQL database using the MySQL tools from your EC2 instance.

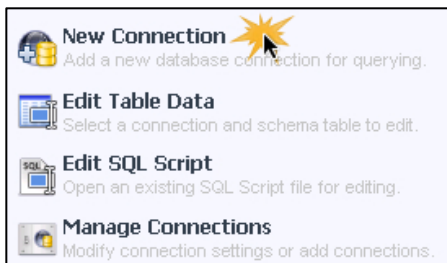
Connecting to the RDS database

1. Using Remote Desktop Connection, log into one of your Windows EC2 instances. For assistance, see the steps in the EC2 lab.

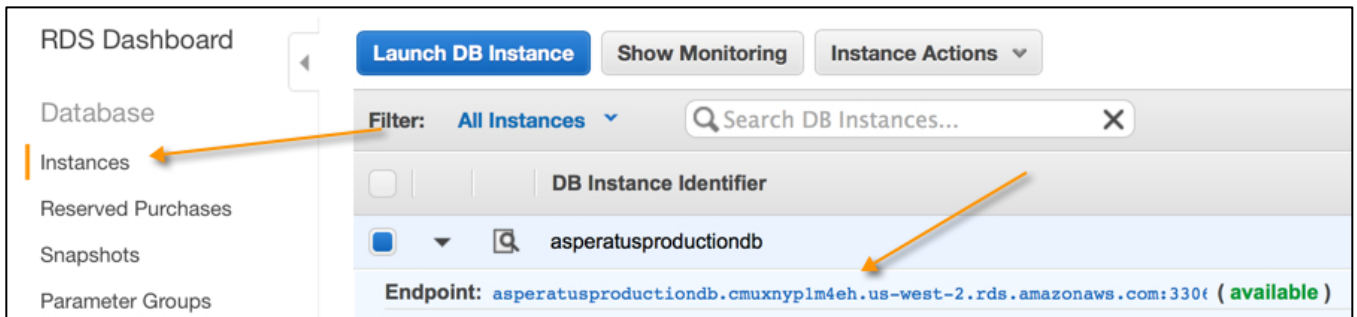
Note: The Windows server password is the password listed on the *qwikLAB* page:



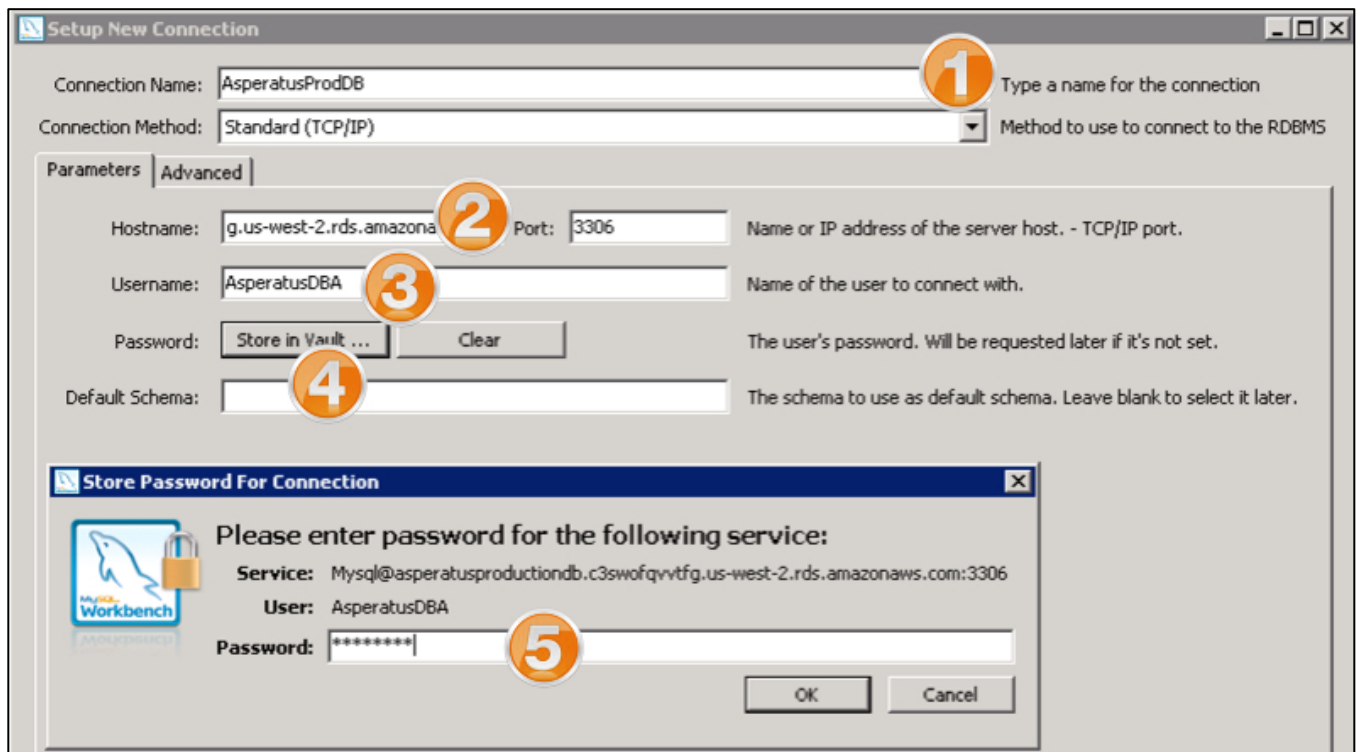
2. From the **Start** menu, click **All Programs > MySQL > MySQL Workbench 5.2 CE**.
3. In MySQL Workbench, click **New Connection**.



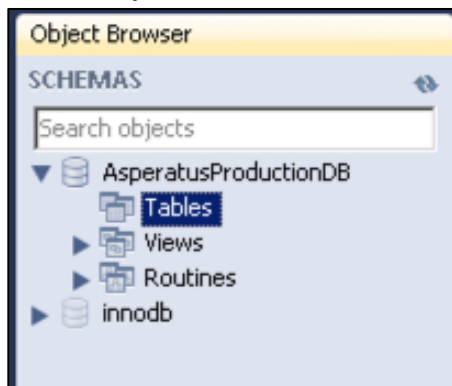
4. You need the connection details to create the new connection. To retrieve the connection details, open **RDS > Database > Instances**. Tick your instance name. Immediately below will be your **Endpoint**. Copy the entire string into notepad or a similar utility.



5. Return to your Windows server instance you are using to connect to the RDS database instance, and in the "Setup New Connection" dialog, type or choose the following:
 - (1) For Connection Name, type a value such as **AsperatusProductionDB**.
 - (2) On the Parameters tab, for Hostname, paste the full Endpoint name (without the ":3306").
 - (3) For Username, type the value you specified earlier (**AsperatusDBA**).
 - (4) Click **Store in Vault**
 - (5) Type the password you specified earlier and click **OK**.
 - (6) Click **Test Connection**.



6. Click OK to dismiss the connection confirmation dialog.
7. Click **OK** in the “Setup New Connection” dialog. This closes the window and returns you to MySQL Workbench.
8. In MySQL workbench, double-click your database **AsperatusProductionDB**.
9. The SQL Editor window opens, showing a successful connection to your database.
10. Expand your database name (**AsperatusProductionDB**). The “Object Browser” allows you to view various schema objects.



RDS Management

In this section you use the RDS Management Console to modify RDS functionality, to create snapshots, to adjust maintenance windows, and to create a deployment across multiple availability zones.

- Take a database snapshot by:
 - Go to **RDS Management Console > Instances**
 - Select your **database instance**
 - Click **Instance Actions > Take DB Snapshot**

RDS Dashboard

Database

Instances **1**

Reserved Purchases

Snapshots

Parameter Groups

Option Groups

Subnet Groups

Events

Event Subscriptions

Launch DB Instance Show Monitoring Instance Actions

Filter: All Instances Search DB Instances...

DB Instance Identifier

asperatusproductiondb1 **2**

Endpoint: asperatusproductiondb1.cgofpt9tysf3.us-west-2.rds.amazonaws.com:3306 (available)

Configuration Details		Security and Network	
DB Name:	AsperatusProductionDB	Availability Zone:	us-west-2b
Engine:	mysql(5.6.13)	VPC ID:	vpc-8486d5ef
Username:	AsperatusDBA	Subnet Group:	default (Complete)
Option Group(s):	default:mysql-5-6 (in-sync)	Subnets:	subnet-9b86d5f0, subnet-9a86d5f1, subnet-9986d5f2
Character Set:		Security Groups:	qlstack2-lab-78-1383588847-Ec2SecurityGroup-170R5JKNLZZLU (sg-e14f4583) (active)
Parameter Group:	default:mysql5.6 (in-sync)		

Instance Actions Events Tags Logs

Modify

Reboot

Delete

Create Read Replica

Promote Read Replica

Take DB Snapshot **3**

Restore to Point in Time

See Details

- In the **Take DB Snapshot** window, input a snapshot name and click **Yes, Take Snapshot**

Take DB Snapshot

To take a snapshot of this DB instance you must provide a name for the snapshot. This feature is currently **supported for InnoDB storage engine only**. If you are using MyISAM, refer to details [here](#).

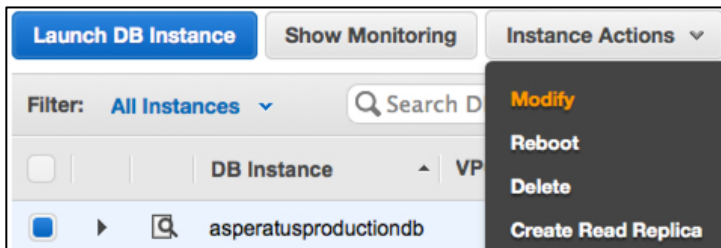
DB Instance: asperatusproductiondb1

Snapshot Name:

3. The RDS Management Console shows the progress of the snapshot in the **Status** column.

Snapshots <input type="text" value="Search DB Snapshots..."/>									
Viewing 1 of 1 DB Snapshots									
DB Snapshot Identifier	DB Instance Identifier	VPC ID	Snapshot Type	Status	Progress	Engine	Storage	Zone	
backupsnapshot	asperatusproductiondb1	vpc-8486d5ef	manual	creating	0%	mysql	5 GB	us-west-2b	

4. In the left panel of the RDS Management Console, click **Instances**.
5. Tick your instance, click **Instance Actions**, and choose **Modify**.



6. The “Modify DB Instance” dialog allows you to increase database size, to change the maintenance window, and to deploy your database across Availability Zones. To modify your database instance, type or choose the following:
- (1) For **Multi-AZ Deployment**, choose **Yes**.
 - (2) For **Allocated Storage**, type **10** (GB).
 - (3) Set the **Maintenance Window** to **Sunday, 09:25 UTC** for **.5** hours.
 - (4) Check **Apply Immediately**.

Modify DB Instance: asperatusproductiondb

DB Instance Identifier: asperatusproductiondb

DB Engine Version: MySQL 5.6.12 (default)

DB Instance Class: db.t1.micro

Multi-AZ Deployment: Yes 1

Auto Minor Version Upgrade: ☒ Yes ☐ No

Allocated Storage*: 10 GB 2
minimum: 5 GB, Maximum: 3072 GB) Higher allocated storage may improve IOPS performance.

Use Provisioned IOPS: ☐

Provisioned IOPS: mysql supports IOPS / GB ratios between 3 and 10

Parameter Group: default.mysql5.6

Security Group: asperatusdbsg
default

Option Group: default:mysql-5-6

New Master Password:

Backup Retention Period: 1 days

Backup Window: Start Time 12 : 19 UTC 3
 Duration: 0.5 hours

Maintenance Window: Start Time Friday 10 : 27 UTC 4
 Duration: 0.5 hours

Apply Immediately: ☒

7. Click **Modify DB Instance**.
8. Your pending changes display in the RDS dashboard.

Pending Changes

Allocated Storage: 10, Multi-AZ

9. After a short time, the changes are committed. This section demonstrates how easy it is to modify a database instance and to make it redundant across multiple availability zones.

Conclusion

Congratulations! You now have successfully:

- Viewed the RDS Management Console
- Created and modified Security Groups
- Launched a MySQL instance
- Connected to and utilized a MySQL instance
- Worked with and adjusted a database

For feedback, suggestions, or corrections, please email: aws-course-feedback@amazon.com.