Webinar Series on Remote Learning

TITLE

Using Amazon RDS in AWS Educate Classrooms

BRIEF SYNOPSIS

This webinar provides a step-by-step tutorial on using Amazon Relational Database Service (Amazon RDS) in AWS Educate classrooms. Learn how to set up and operate a relational database in the cloud.

This webinar covers:

- A brief introduction to Amazon RDS, some use cases, and the AWS Management Console.
- How students in AWS Educate Classrooms can navigate to and use Amazon RDS.
- How to select which database engine and instance type you need.
- Steps to provisioning an Amazon RDS instance.
- How educators can review student work.

SPEAKER

Ryan Little

SPEAKER BIO:

Technical Program Manager, AWS WWPS

DURATION

41 min

TIMESTAMPS

0:00 – Speaker Introduction and Agenda

3:10 – How students access AWS Educate Classrooms and SSO into the AWS Management Console

6:23 – Navigating the AWS Management Console and Getting Started with Amazon EC2

11:23 – Introduction to Amazon RDS

14:04 – Selecting the database engine and instance type you need

19:30 – Provisioning an Amazon RDS instance

22:24 – How educators access AWS Educate Classrooms and promotional credits

25:15 – How educators can review student work via AWS Educate Classrooms

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SUMMARY

During this demonstration, Ryan Little shows viewers how to provision an Amazon RDS instance from AWS Educate Classrooms. AWS Educate Classrooms let you create a virtual space for students to learn about the cloud in a hands-on environment. Each classroom is tailored to a different topic, including cloud basics, big data, and machine learning.

Amazon Relational Database Service (Amazon RDS) is a managed 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. Get started provisioning your own Amazon RDS instance here.

If you enjoyed this content, be sure to check out our live and on-demand webinars here.

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FAQs

AWS Educate

Q: Who is a good fit for AWS Educate?
A: Membership to AWS Educate is open to all AWS-approved accredited educational institutions, educators, students, and U.S. veterans, transitioning military, and their spouses. If you are a student aged 14 or older currently enrolled in high school, community college, technical institution, or university, AWS Educate is a great fit for you.* AWS customers and partners can tap into this community of cloud-skilled job candidates free of charge.

Q: How do I sign up?
A: Getting started with AWS Educate is easy. Students ages 18+ and educators can complete our application and apply today. For fast approval into the program, sign up using the email address provided by your educational institution.
K12 students between the ages of 14-17 can request membership with their .edu email address, an email address provided by an AWS Educate member institution, or with a URL provided to them by their teacher.
K12 educators should first sign up as an AWS Educate member. Then, they have the ability to invite their students through several tools that streamline the approval process within their educator portal.
For students who cannot register through one of the methods above, they can apply with their personal email address. However, their application may take a little longer and they will need to provide proof of student status.
Employers must be AWS Partners or customers and can complete the application online. Employers are then reviewed and approved by the AWS Educate team and notified via email.

Q: I'm new to cloud computing. Can AWS Educate help me?
A: Yes! If you're new to cloud computing, first take the Cloud 101 Pathway. Cloud 101 offers a crash course on the cloud, its history, solutions, and why companies across the globe are looking for employees with cloud expertise. Looking for more "getting started" options? Check out the Cloud Literacy Badge to get introduced to the cloud through interactive challenges.

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FAQs

Q: What is the difference between an AWS Educate Started Account and an AWS Account?
A: The AWS Educate Starter account offers students no-cost access to a specified, capped amount of AWS cloud resources without requiring a credit card for payment. The account provides access to most AWS Cloud services but does not allow for post-graduation portability. View the services supported with an AWS Educate Starter account.
Educators have the option to sign up with an AWS account or an AWS Educate Starter account. Selecting an AWS account allows for the greatest amount of flexibility, access to AWS services, eligibility for AWS Free Tier in year one and a larger AWS Promotional Credit amount. The AWS Educate Starter account is a great alternative only if you do not have access to a credit card.
The ability to sign up with an AWS account is only available to educator members.

Q: What is AWS Promotional Credit? How will it help me gain cloud skills?
A: AWS Promotional Credit is an amount credited to your AWS account or AWS Educate Starter account that allow you to use AWS services without incurring fees. AWS Educate members use AWS Promotional Credit to practice the skills they learn through pathways and badges to continue to gain increasing expertise in cloud technology and AWS services. Educators can work with students to use AWS Promotional Credit on a variety of classroom assignments and activities using AWS services.
Note that the ability to sign up with an AWS account is only available to educator members.

Q: How much AWS Promotional Credit comes with my membership?
A: Students ages 18+ who enroll with an AWS Educate Starter account at a member institution receive $100 in AWS Promotional Credit and $30 in credit at a non-member institution.
Students between the ages of 14-17 who enroll with an AWS Educate Starter Account at a member institution will receive $75 in AWS Promotional Credit and $30 in credit at a non-member institution.
Educators who enroll with an AWS account at a member institution receive $200 in AWS Promotional Credit and $75 in credit at a non-member institution.
Educators who enroll with an AWS Educate Starter account at a member institution receive $150 in AWS Promotional Credit and $50 in credit at a non-member institution.
U.S. Veterans who enroll with an AWS Educate Starter account receive $50 in AWS Promotional Credits.
The ability to sign up with an AWS account is only available to educator members.

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FAQs

Q: What kind of jobs are posted on the AWS Educate Job Board?
A: All AWS Educate members 18 and older can review and apply for full time jobs and internships from around the world through the AWS Educate Job Board. The Job Board is designed specifically to host early-career cloud jobs aligned to the skills Educate members gain through the AWS Educate Cloud Degree program and AWS Educate Cloud Career Pathways.
Employers can post an unlimited number of jobs that match the skills and abilities of AWS Educate member students. This can be done either individually, or, if approved, through a no-cost, automatic scraping service provided by AWS.

Q: How do I know if my school or organization is a member institution?
A: View our member institution list here.

Q: Can I invite other educators or students to join AWS Educate?
A: Absolutely! Participation in AWS Educate is available to all AWS-approved educational institutions, educators, and students around the globe. Please direct interested contacts to registration here.

Q: What is the AWS Educate Cloud Degree Program?
A: The AWS Educate Cloud Degree Program is a collaborative effort between AWS Educate and higher education institutions to develop degrees in cloud computing. Learn more about AWS Educate Cloud Degree here.

Q: How do I know if my cloud skills match what a company is hiring for?
A: The best way to make employers aware of your skills is to ensure you have a fully completed student profile, including a resume (CV), project examples, and links to activities and experiences relevant to the cloud job you are seeking.
Employers can set job alerts—much like students can—that notify them when a student meets the hiring criteria they have set for a role. A student must opt into making their profile shareable for them to be identified by potential employers.

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FAQs

Amazon RDS

Q: What is Amazon RDS?
A: Amazon Relational Database Service (Amazon RDS) is a managed 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, MariaDB, Oracle, SQL Server, or PostgreSQL database. This means that the code, applications, and tools you already use today with your existing databases should work seamlessly with Amazon RDS. Amazon RDS can automatically back up your database and keep your database software up to date with the latest version. You benefit from the flexibility of being able to easily scale the compute resources or storage capacity associated with your relational database instance. In addition, Amazon RDS makes it easy to use replication to enhance database availability, improve data durability, or scale beyond the capacity constraints of a single database instance for read-heavy database workloads. As with all Amazon Web Services, there are no up-front investments required, and you pay only for the resources you use.

Q: Which relational database engines does Amazon RDS support?
A: Amazon RDS supports Amazon Aurora, MySQL, MariaDB, Oracle, SQL Server, and PostgreSQL database engines.

Q: What does Amazon RDS manage on my behalf?
A: Amazon RDS manages the work involved in setting up a relational database: from provisioning the infrastructure capacity you request to installing the database software. Once your database is up and running, Amazon RDS automates common administrative tasks such as performing backups and patching the software that powers your database. With optional Multi-AZ deployments, Amazon RDS also manages synchronous data replication across Availability Zones with automatic failover.
Since Amazon RDS provides native database access, you interact with the relational database software as you normally would. This means you're still responsible for managing the database settings that are specific to your application. You'll need to build the relational schema that best fits your use case and are responsible for any performance tuning to optimize your database for your application’s workflow.

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FAQs

Q: When would I use Amazon RDS vs. Amazon EC2 Relational Database AMIs?
A: Amazon Web Services provides a number of database alternatives for developers. Amazon RDS enables you to run a fully featured relational database while offloading database administration. Using one of our many relational database AMIs on Amazon EC2 allows you to manage your own relational database in the cloud. There are important differences between these alternatives that may make one more appropriate for your use case. See Cloud Databases with AWS for guidance on which solution is best for you.

Q: How do I get started with Amazon RDS?
A: To sign up for Amazon RDS, you must have an Amazon Web Services account. Create an account if you do not already have one. After you are signed up, please refer to the Amazon RDS documentation, which includes our Getting Started Guide.
Amazon RDS is part of the AWS Free Tier so that new AWS customers can get started with a managed database service in the cloud for free.

Q: Are there hybrid or on-premises deployment options for Amazon RDS?
A: Yes, you can run RDS on premises using Amazon RDS on Outposts and Amazon RDS on VMware. Please see the Amazon RDS on Outposts and Amazon RDS on VMware FAQs for additional information.

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RESOURCES

Amazon EC2 - Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.

AWS Educate - AWS Educate gives students and educators access to content and programs that enable them to skill up for cloud careers in growing fields. AWS Educate also connects companies hiring for cloud skills to qualified student job seekers with the AWS Educate Job Board.

AWS Educate Office Hours for Educators and Students – Webinars, office hours, and training sessions for educators and students

AWS User Groups - User groups are peer-to-peer communities which meet regularly to share ideas, answer questions, and learn about new services and best practices.

Amazon RDS – Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud.

Amazon RDS User Guide – The Amazon RDS User Guide describes all Amazon RDS concepts and provides instructions on using the various features with both the console and the command line interface.

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Immersion Day

Getting Started with Amazon RDS

August 2018

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Overview

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.

This lab has a prerequisite of *Immersion Day – Getting Started with EC2* in order to complete. This part of the lab will demonstrate configuring a previously created web server in the *Immersion Day – Getting Started with EC2* lab to use RDS for its Relational Database Management System (RDBMS) needs.

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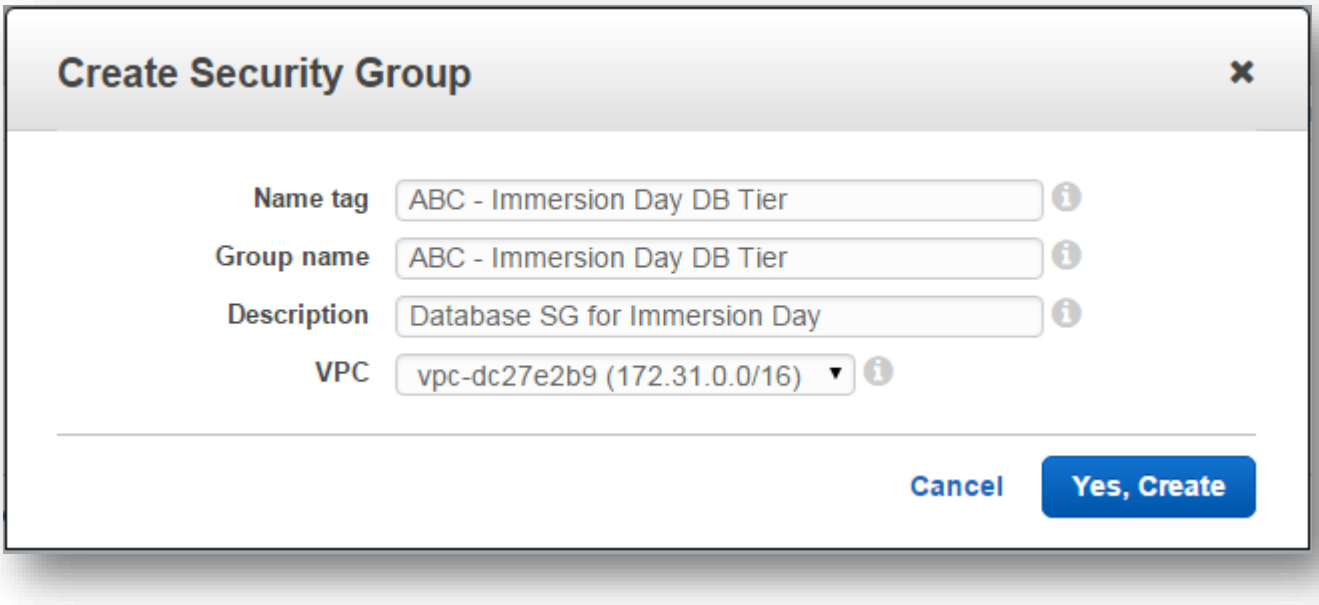
Add a VPC Instance Security Group

Prerequisite: Immersion Day – Getting Started with EC2

The RDS servers have the same security model as Amazon EC2 overall: trust nothing. A common use of an RDS instance in a VPC is to share data with an application server running in an EC2 instance in the same VPC and that is accessed by a client application outside the VPC. To this end, we'll need to utilize a VPC security group to allow this access.

If you've already completed the instructions in the "Immersion Day – Getting Started with EC2" lab manual, you'll have an existing EC2 instance with an existing security group. The name will be "[Initials] – Immersion Day Web Tier." Let's create a new VPC security group for our database tier that only allows traffic from our web tier. In the VPC dashboard, click **Security Groups**, then the **Create Security Group** button. Set *Name tag* and *group name* to "[Initials] - Immersion Day DB Tier." Write a short description, and keep the VPC setting to the same VPC you've launched your EC2 instance in. Then click **Yes, Create**.



After your VPC security group is created, you'll see the details of it in the lower pane on the screen. Click **Inbound Rules**, then the **Edit** button.

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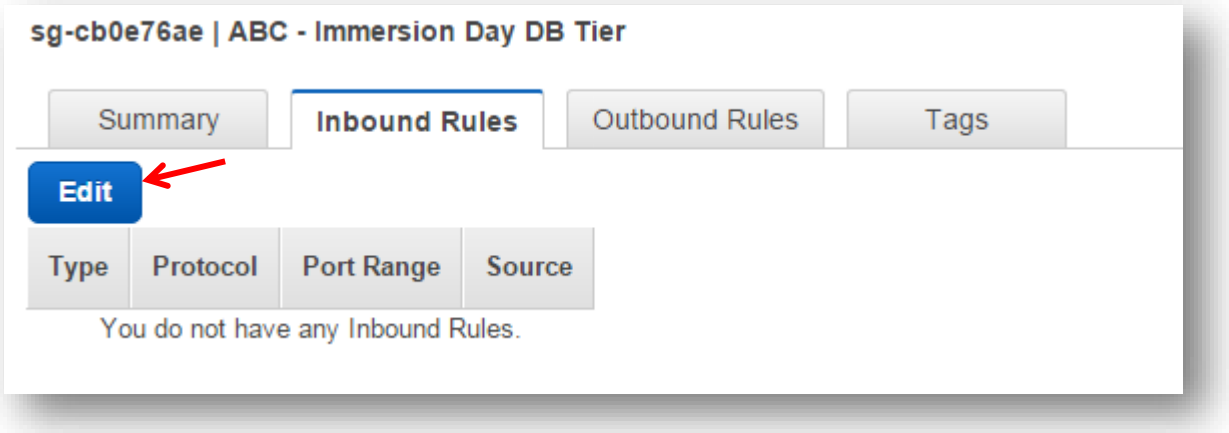
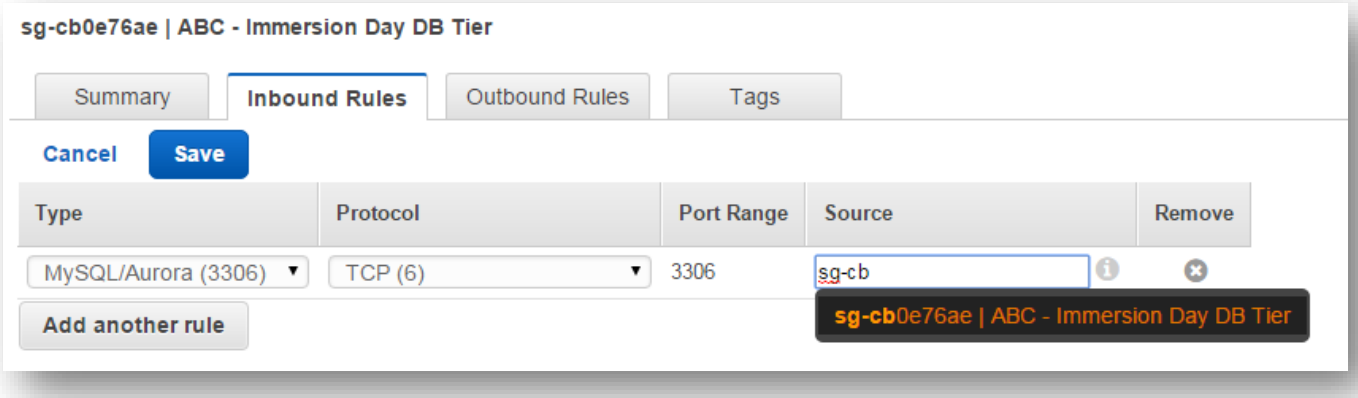


Add a new inbound rule for the EC2 server(s) in our web tier. The *type* should be **MySQL/Aurora (3306)**, the *protocol* **TCP (6),** and in the *source* box, type the name of the security group to which your EC2 instance belongs. While you're typing, a list of security group(s) that match that name should be presented to you. Select your security group, then click the **Save** button.



Launch an RDS Instance

Now that our VPC security group is ready, let's configure and launch a MySQL RDS Instance.

1. Sign into the AWS Management Console and open the Amazon RDS console at https://console.aws.amazon.com/rds.

2. Click on **Create database** or **Get Started Now**

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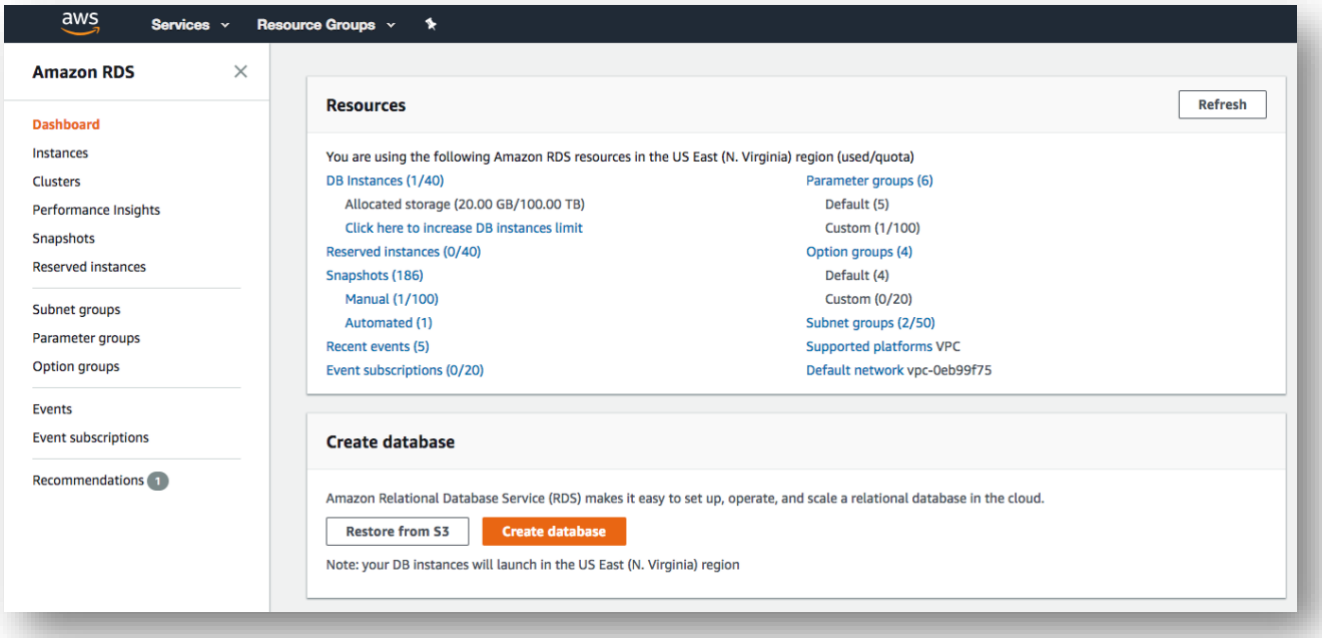
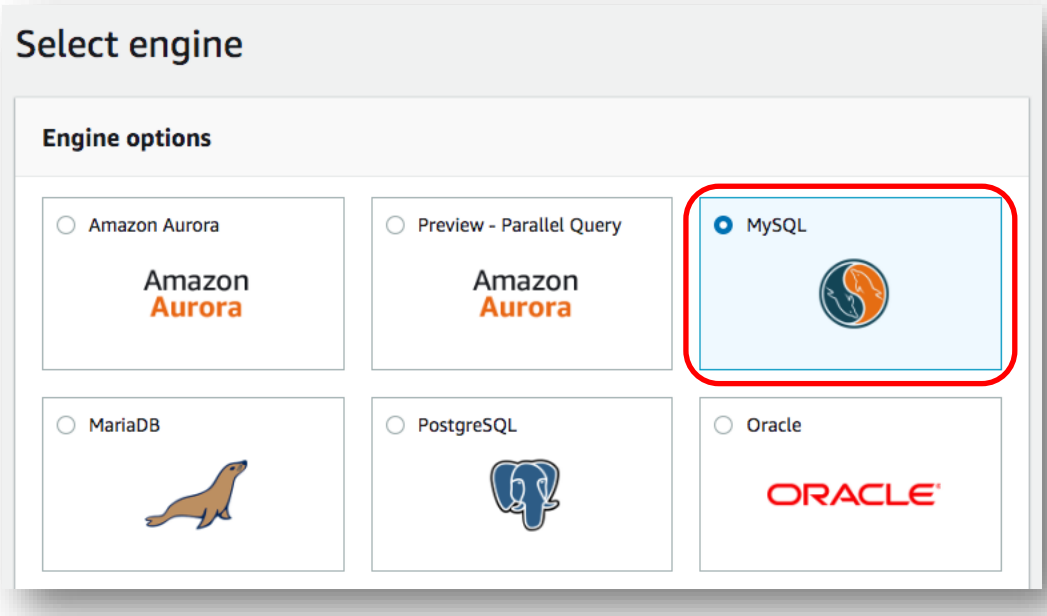


3. We will be using a MySQL database, so choose MySQL from the available engines.



4. Check **Only enable options eligible for RDS Free Usage Tier**, at the bottom of the page, and then click **Next**. (Note: this is not recommended for production databases, as this

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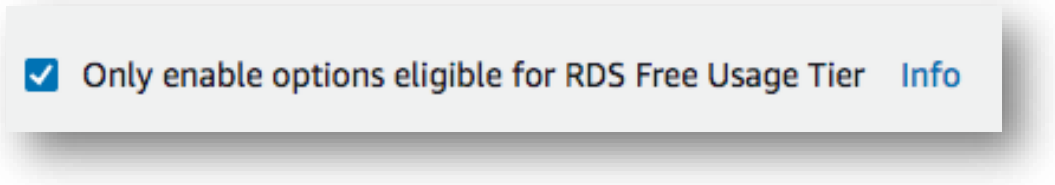
option will disable options such as Multi-AZ deployments or read replicas, but it is OK for the purposes of this lab.)



5. Fill out the DB Instance details with the following information and click **Next:**

   - DB Engine Version: Use the default engine version (“5.7.22” as of August, 2018)
   - DB Instance Class: db.t2.micro
   - Storage Type: General Purpose (SSD)
   - Allocated Storage: 20 GB
   - DB Instance Identifier: awsdb
   - Master Username: awsuser
   - Master Password: awspassword

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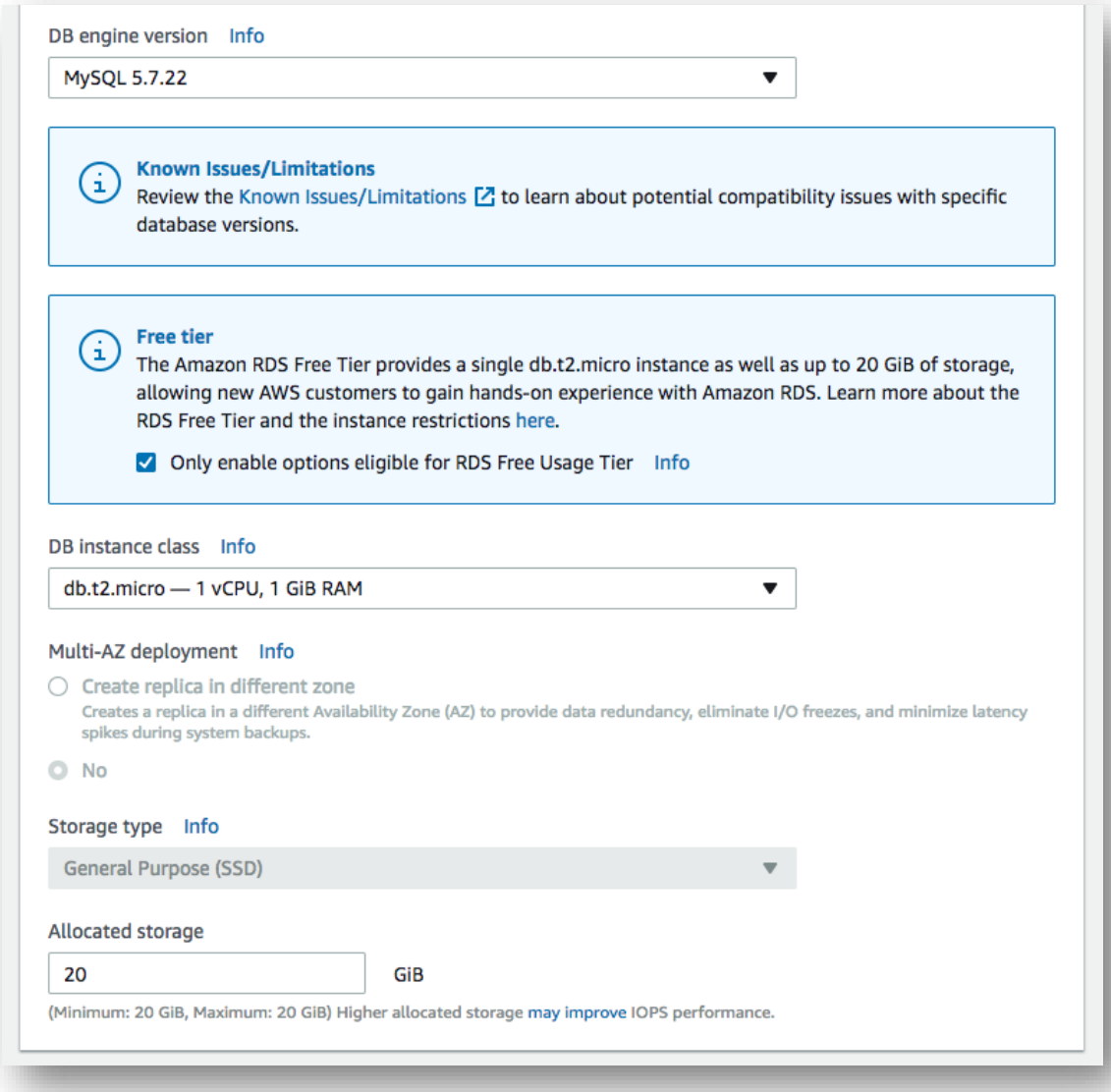

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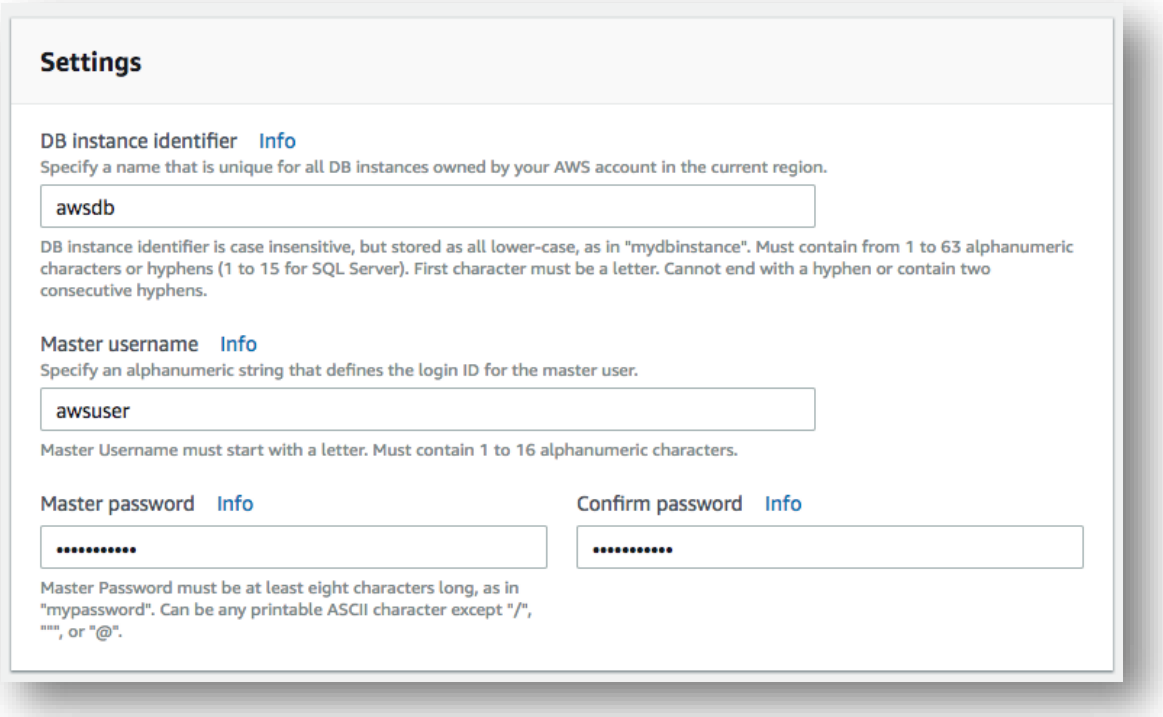

6. In **Configure Advanced Settings,** fill out *Network & Security* with the following information:

   - VPC: Default VPC
   - Subnet Group: default
   - Public Accessibility: No
   - Availability Zone: No Preference
   - VPC Security Group(s): Select *Choose existing VPC security groups*, then pick [Initials] – Immersion Day DB Tier

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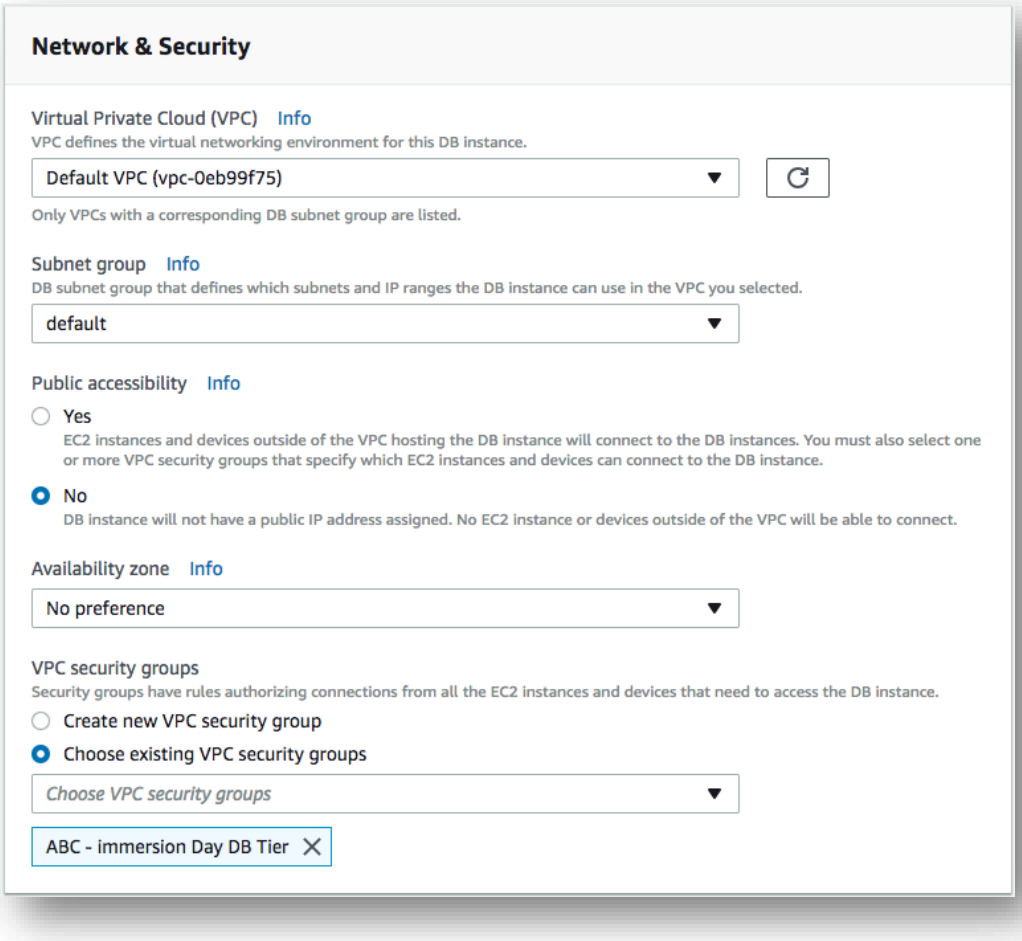

7. Under *Database Options*, enter a DB name called “immersionday” and accept the defaults for *database port, parameter group, option group* and *IAM DB authentication*. Leave the default options for the rest of the configuration groups (*Encryption, Backup, Monitoring, Log exports* and *Maintenance*).

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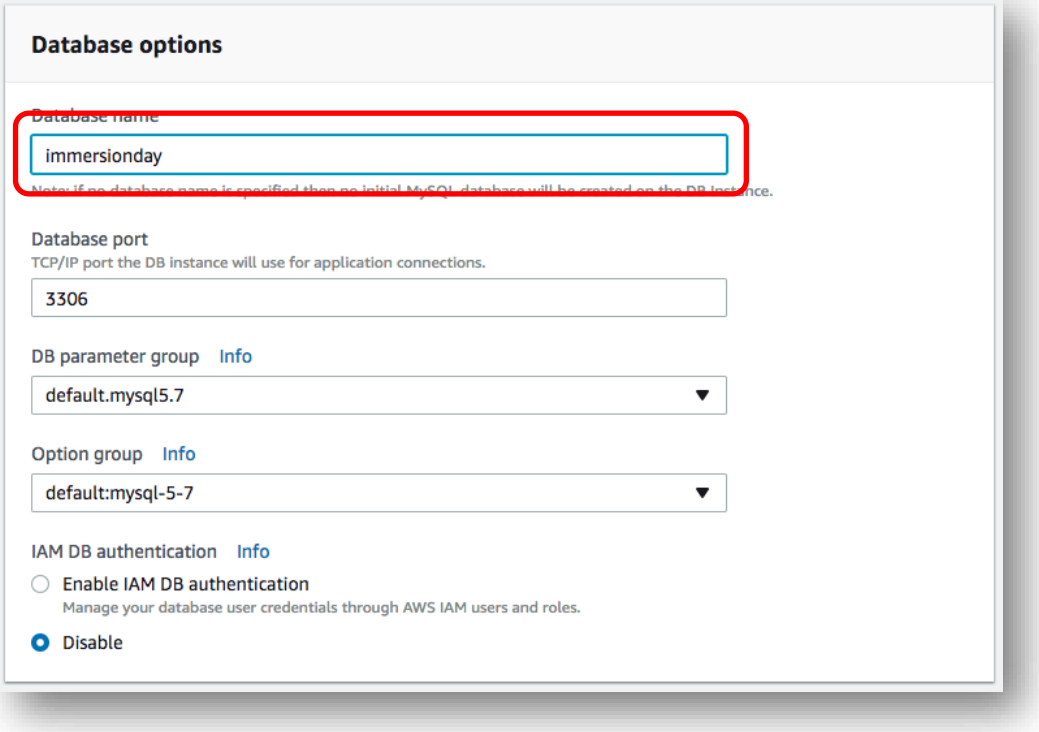

- Review your settings and click **Create database**.
- In the RDS Dashboard, monitor your new DB instance until the status changes from “creating” to “backing up” to “available”.

Note: This may take up to 5 minutes as the database is being created and backed up.

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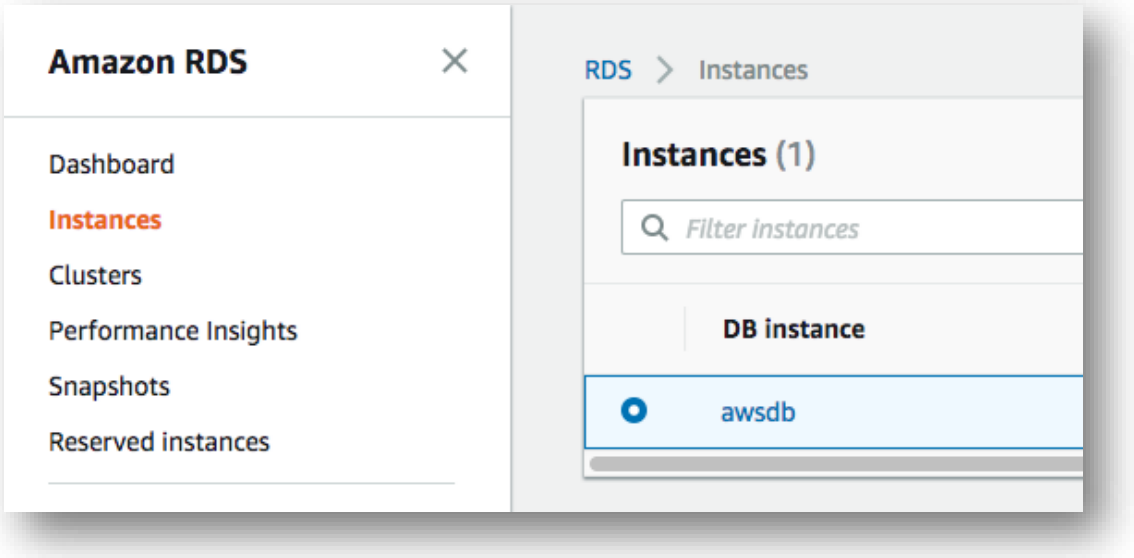
Configure Instance to Leverage RDS

Prerequisite: Immersion Day – Getting Started with EC2

We provided an example database table and sample code for creating a simple address book. Before configuring your instance, you will need to get the URL for your database endpoint.

1. In the RDS console, click on **Instances** and then select your database instance, *awsdb*.



2. Scroll down to the *Connect* section and check the value under *Endpoint*. Remember this because you will need it in a minute.

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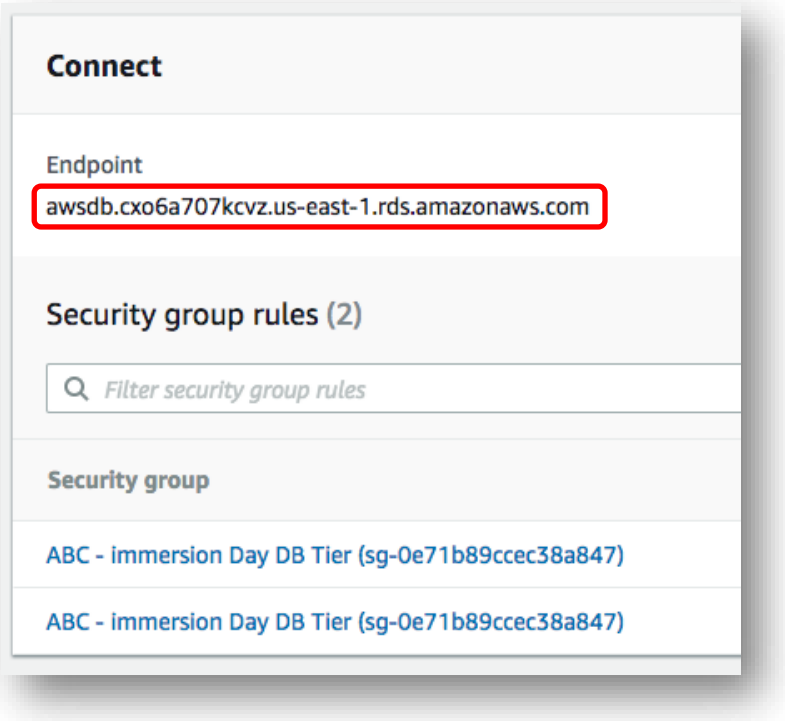

3. Navigate to the browser tab connected to web application you launched previously in the *Immersion Day – Getting Started with EC2* lab (or open a new tab and reconnect to your web server's URL) and click on **RDS.** You should see a prompt to enter the DB endpoint (do NOT include :3306 at the end of the DB endpoint), username (*awsuser*), password (*awspassword*) and database (*immersionday*) information you just created. Click the **Submit** button.

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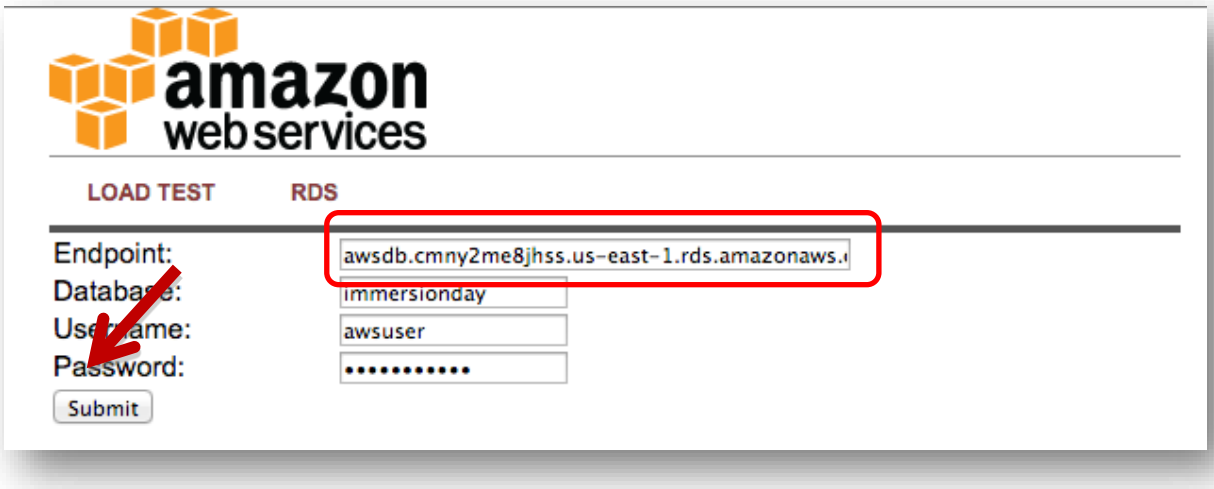
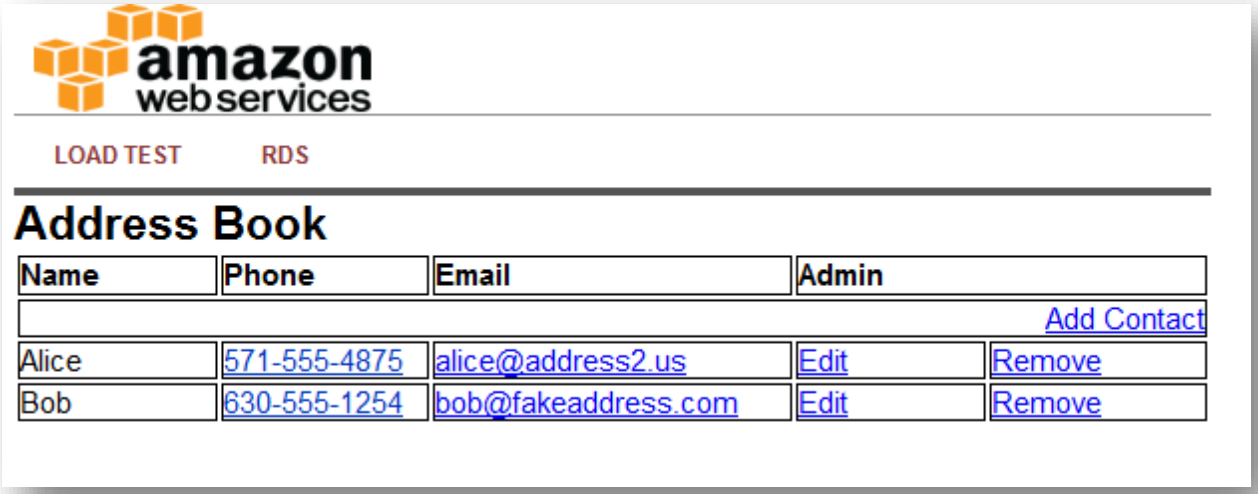


4. When complete, you will be redirected to a simple page displaying all of the information from the database you just created.



This is a very basic example of a simple address book interacting with a MySQL database managed by AWS. RDS can support much more complicated relational database scenarios, but we hope this simple example will suffice to demonstrate the point.

Feel free to play around with the address book and add/edit/remove content from your RDS database by using the **Add Contact**, **Edit**, and **Remove** links in the Address Book.

Great Job: You have successfully deployed and utilized an AWS managed MySQL database!!!

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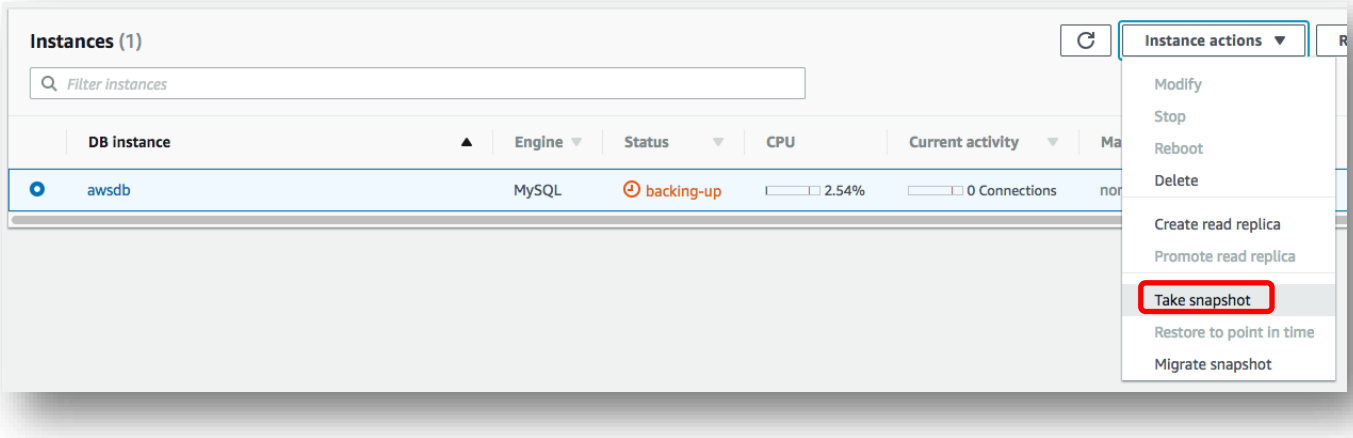
Appendix – Additional RDS Features

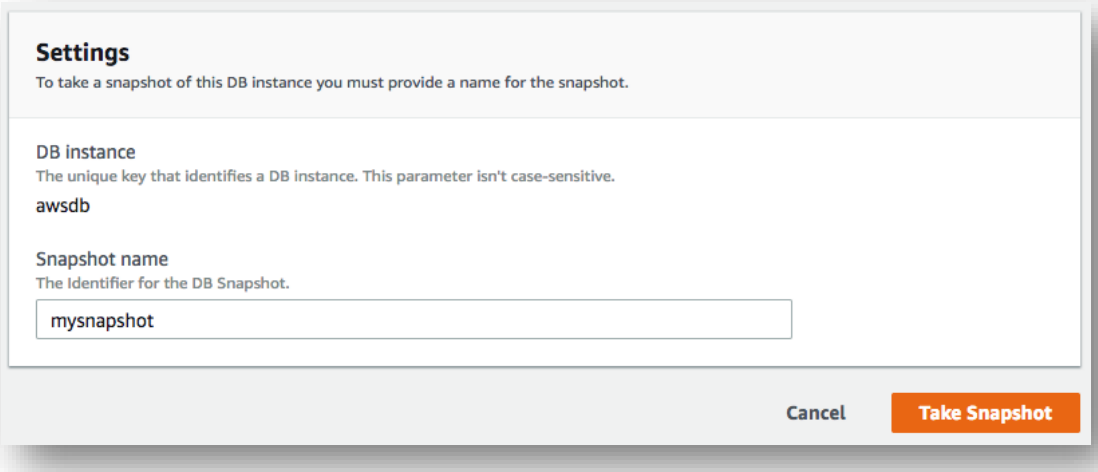
Create an RDS Snapshot

Now is a good time to take a snapshot of your RDS database. Taking a snapshot enables you to back up your DB Instance in a known state as frequently as you wish, and then restore to that specific state at any time.

In the RDS section of the of the AWS management console, select your RDS instance, click on **Instance actions** and select **Take snapshot**:



The next screen will ask you for a name. Enter **mysnapshot** and click **Take snapshot**.



Note: Using single-instance RDS, you will incur downtime for as long as it takes to make a backup. Of course our example database is so small that total time to back up is very small too!

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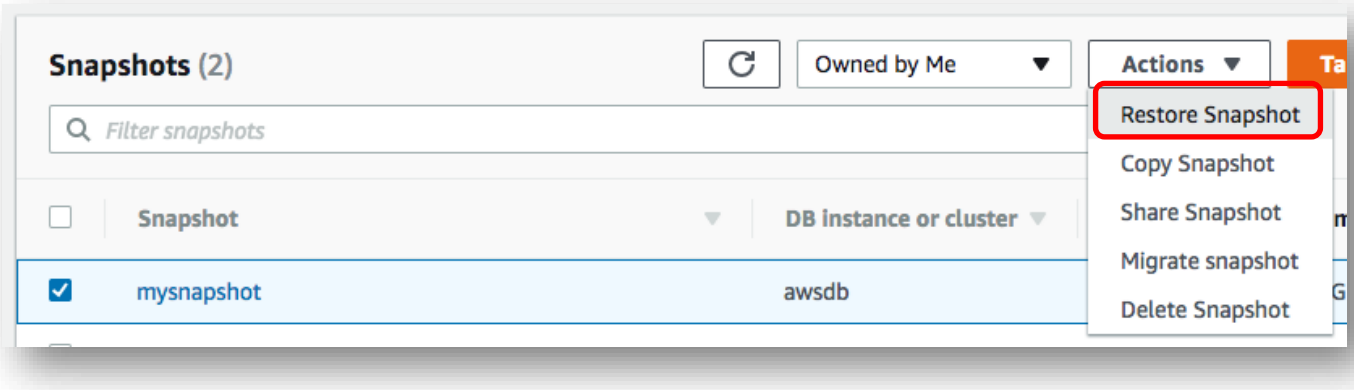
DB snapshots show up under the **Snapshots** link on the left side of the screen. Notice that you can easily launch new RDS instances from any previous snapshot!



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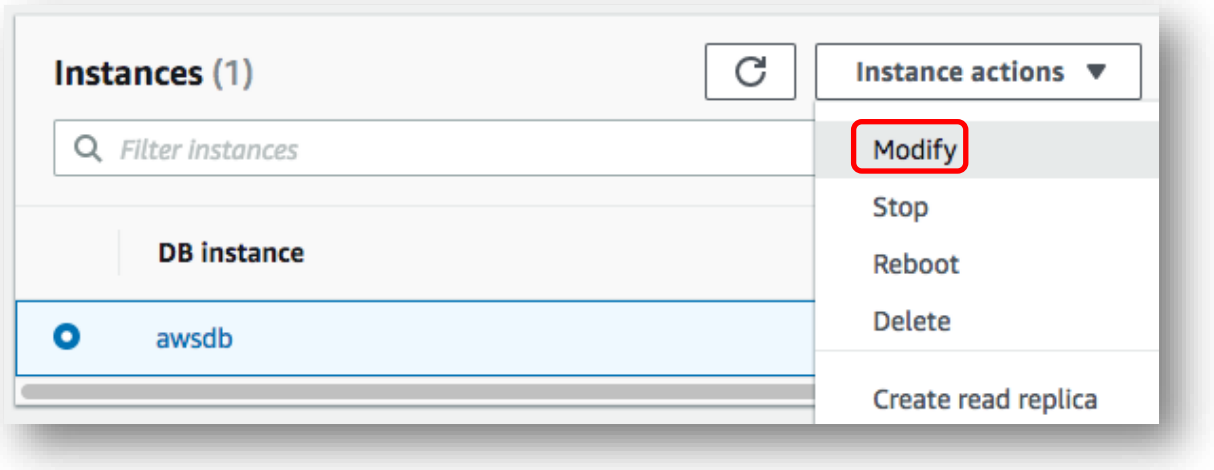
Modify RDS Instance Size

Scaling up and down with RDS is simple via the AWS Console. You can grow the database or change the underlying server size, etc. – all from the AWS Console.

Select your RDS DB instance, click **Instance actions** and then **Modify**.



Try changing to a Large instance, and if you want, also grow the database at the same time. Click **Next**.

In the next screen, don't forget to click **"Apply Immediately"** – otherwise changes will be queued for the next maintenance window.

Tip: You can change instance sizes up or down at any time. However you cannot shrink a database once you grow it.

Just like backups, there will be an outage while you perform these operations. In general, major RDS reconfigurations such as scaling database sizes or machine size take between 4 and 12 minutes.

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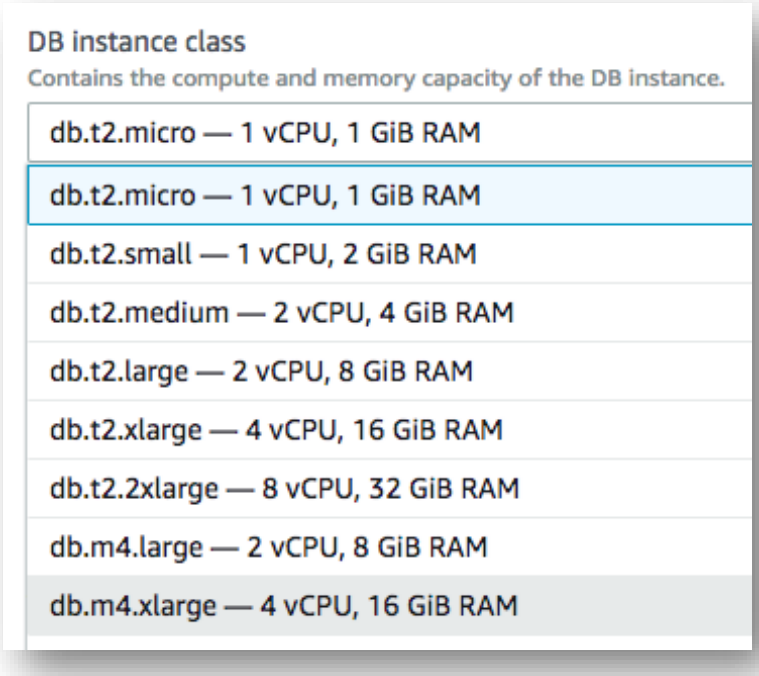

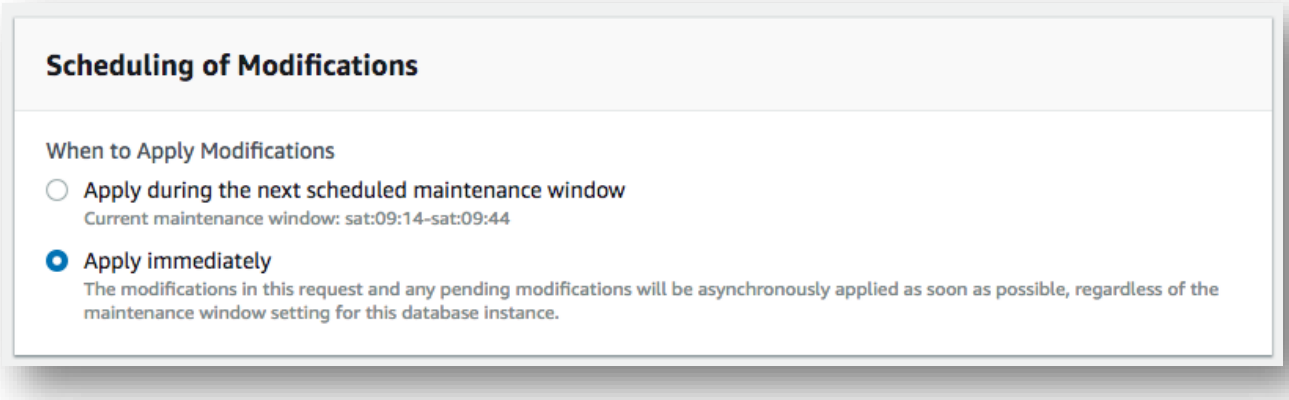

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