

EXPERIMENT NO. 8

Aim: To study and implement Database as a Service on SQL Databases using AWS RDS

Theory:

Database as a Service (DBaaS) is a cloud computing service model that provides users with access to a managed database system. In this model, the database management tasks such as provisioning, configuration, maintenance, backups, and scaling are handled by the service provider, freeing the users from the burden of managing the underlying infrastructure.



Database as a Service

Key features of DBaaS include:

1. **Managed Services:** The service provider manages the infrastructure and software, including updates, patches, and backups, allowing users to focus on their applications rather than on database maintenance.
2. **Scalability:** DBaaS typically offers scalability features, allowing users to easily scale their database resources up or down based on demand without worrying about hardware procurement or configuration changes.
3. **Security:** Providers typically implement security measures to protect data stored in the database, including encryption, access controls, and compliance certifications.
4. **Cost-effectiveness:** Users pay for the resources they consume on a subscription or pay-as-you-go basis, which can be more cost-effective compared to managing an on-premises database infrastructure.

Some popular Database as a Service providers and their services include:

1. Amazon Web Services (AWS):

- Amazon RDS (Relational Database Service)
- Amazon DynamoDB

- Amazon DocumentDB
- Amazon Neptune
- Amazon Aurora

2. Microsoft Azure:

- Azure SQL Database
- Azure Cosmos DB
- Azure Database for MySQL
- Azure Database for PostgreSQL

3. Google Cloud Platform (GCP):

- Google Cloud SQL
- Google Cloud Firestore
- Google Cloud Spanner
- Google Cloud Bigtable

4. IBM Cloud:

- IBM Db2 on Cloud
- IBM Cloud Databases for PostgreSQL
- IBM Cloudant

5. Oracle Cloud:

- Oracle Autonomous Database
- Oracle MySQL Database Service
- Oracle NoSQL Database Cloud Service

SQL/NOSQL databases supported by AWS:

1. Amazon RDS (Relational Database Service)
2. Amazon Aurora
3. Amazon DynamoDB
4. Amazon DocumentDB
5. Amazon Neptune

6. Amazon Keyspaces (for Apache Cassandra)

7. Amazon ElastiCache (supports Redis and Memcached, which are in-memory data stores)

8. Amazon Redshift

Feature	Amazon RDS	Amazon Aurora
Database Engine Support	Supports various SQL databases like MySQL, PostgreSQL, Oracle, SQL Server, and MariaDB	Compatible with MySQL and PostgreSQL, but uses a MySQL-compatible database engine developed by Amazon
Performance	Good performance, but may have limitations in scalability for high-traffic applications	Designed for high performance and scalability, capable of handling high throughput and large workloads
Scalability	Limited scalability compared to Aurora	Provides auto-scaling capabilities, allowing for storage and compute resources to scale independently
Storage	Uses standard storage with SSD or HDD options	Uses a distributed, fault-tolerant storage system designed for Aurora's architecture, providing higher performance
Read Replicas	Supports read replicas for scaling read-heavy workloads	Provides Aurora Replicas, which are similar to read replicas but with higher performance and reliability
Availability	Offers Multi-AZ deployments for high availability with automated failover	Provides Aurora Global Database for cross-region replication and disaster recovery
Backups and Recovery	Supports automated backups and manual snapshots	Offers continuous backups and point-in-time recovery with no performance impact
Cost	Generally lower cost compared to Aurora	Aurora is usually more expensive but offers better performance and scalability
Compatibility	Compatible with standard SQL databases	Compatible with MySQL and PostgreSQL, with some differences in features and compatibility
Maintenance	Users are responsible for database maintenance tasks such as updates, patches, and backups	Amazon manages most maintenance tasks, reducing the burden on users

1. Storage types:

- Storage types refer to the different options available for storing data associated with your database instance in AWS DBaaS.

- AWS offers various storage options optimized for different workloads and performance requirements.

2. Endpoint:

- An endpoint in AWS DBaaS is the network address or URL used to connect to a database instance.

- Each database instance typically has a unique endpoint associated with it, consisting of a hostname and port number required for connection.

3. Snapshot:

- A snapshot in AWS DBaaS is a point-in-time copy of your database instance's data stored in Amazon S3.

- Snapshots are useful for backups, disaster recovery, and cloning database instances.

- They can be created manually or automatically at regular intervals.

4. Read Replica:

- A read replica in AWS DBaaS is a copy of the primary (master) database instance that is asynchronously replicated to one or more secondary (replica) instances.

- Read replicas are used to offload read traffic from the primary instance, improving read scalability and performance.

- Applications can send read queries to read replicas, while write operations are still directed to the primary instance.

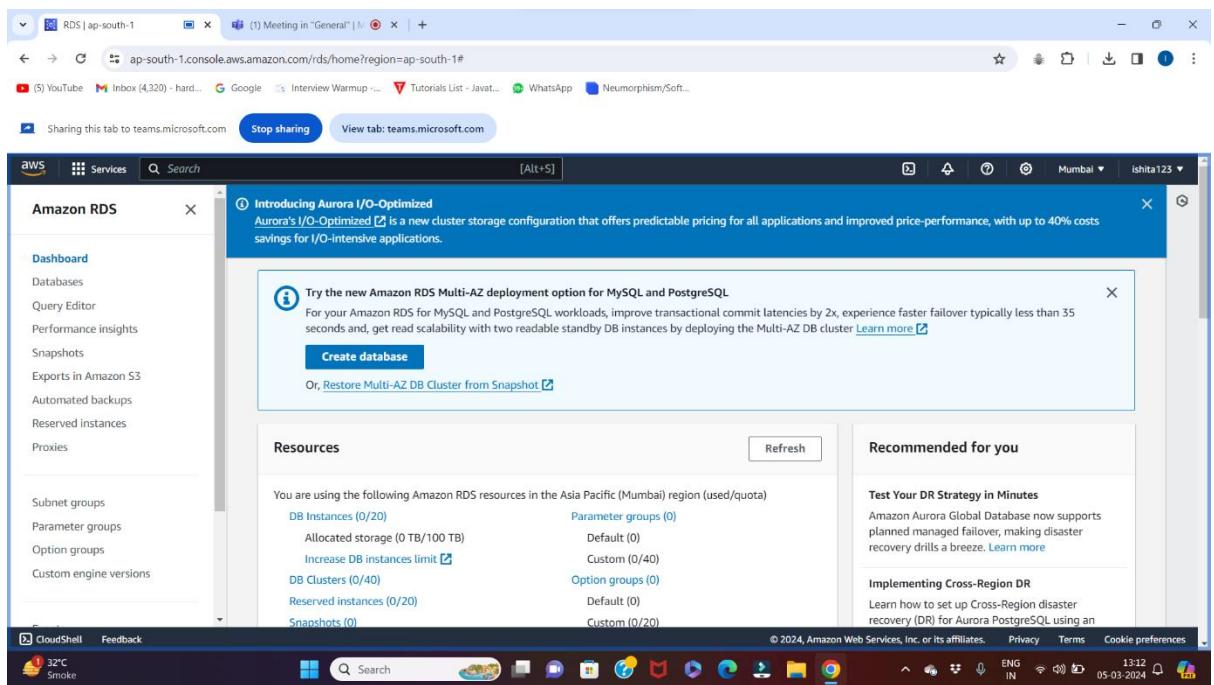
- Read replicas can be promoted to become standalone instances in case of a primary instance failure or for scaling out read capacity.

5. Single AZ and Multi AZ instances:

- Single-AZ instances run in a single availability zone and are suitable for non-critical workloads.
- Multi-AZ instances provide high availability by automatically replicating the database to a standby instance in a different availability zone.
- In the event of a failure in the primary AZ, AWS automatically fails over to the standby instance in the secondary AZ, minimizing downtime and ensuring data durability.

Implementation:

1. Create Database



Screenshot of the AWS RDS console showing the "Create database" wizard.

The top section, "Choose a database creation method", offers two options:

- 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.

The "Engine options" section lists various engine types:

- Aurora (MySQL Compatible)
- Aurora (PostgreSQL Compatible)
- MySQL
- MariaDB
- PostgreSQL
- Oracle
- Microsoft SQL Server
- IBM Db2

A modal window for "MySQL" provides detailed information:

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 64 TiB.
- Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
- Supports automated backup and point-in-time recovery.
- Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.

System tray icons and browser status bar details are visible at the bottom.

The screenshot shows the AWS RDS MySQL creation wizard. In the top navigation bar, the URL is `ap-south-1.console.aws.amazon.com/rds/home?region=ap-south-1#launch-dbinstance;isHermesCreate=true`. The main content area displays the MySQL Community edition selected. A sidebar on the right provides a summary of MySQL's features, including support for database sizes up to 64 TiB, various instance classes, automated backup, and point-in-time recovery.

Edition: MySQL Community

Known issues/limitations: Review the [Known Issues/limitations](#) to learn about potential compatibility issues with specific database versions.

Engine version: MySQL 8.0.35

Show versions that support the Multi-AZ DB cluster: Create a Multi-AZ DB cluster with one primary DB instance and two readable standby DB instances. Multi-AZ DB clusters provide up to 2x faster transaction commit latency and automatic failover in typically under 35 seconds.

Show versions that support the Amazon RDS Optimized Writes: Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

Engine Version: MySQL 8.0.35

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.

Availability and durability:

Deployment options: The deployment options below are limited to those supported by the engine you selected above.

- Multi-AZ DB Cluster:** Creates a DB cluster with a primary DB instance and two readable standby DB instances, with each DB instance in a different Availability Zone (AZ). Provides high availability, data redundancy and increases capacity to serve read workloads.
- Multi-AZ DB instance (not supported for Multi-AZ DB cluster snapshot):** Creates a primary DB instance and a standby DB instance in a different AZ. Provides high availability and data redundancy, but

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RDS | ap-south-1

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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.
 1 to 16 alphanumeric characters. The first character must be a letter.

Credentials Settings

Master username [Info](#)
Type a login ID for the master user of your DB instance.
 Manage master credentials in AWS Secrets Manager
Manage master user credentials in Secrets Manager. RDS can generate a password for you and manage it throughout its lifecycle.

If you manage the master user credentials in Secrets Manager, some RDS features aren't supported. [Learn more](#)

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Q | selected above.

db.t2.micro	1 vCPU	1 GiB RAM	Not EBS Optimized
db.t2.small	1 vCPU	2 GiB RAM	Not EBS Optimized
db.t2.medium	2 vCPUs	4 GiB RAM	Not EBS Optimized
db.t2.large	2 vCPUs	8 GiB RAM	Not EBS Optimized
db.t2.xlarge	4 vCPUs	16 GiB RAM	Not EBS Optimized
db.t2.2xlarge	8 vCPUs	32 GiB RAM	Not EBS Optimized
db.t2.micro	1 vCPU	1 GiB RAM	Not EBS Optimized

Storage

Storage type [Info](#)
General Purpose SSD (gp2)

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ap-south-1.console.aws.amazon.com/rds/home?region=ap-south-1#launch-dbinstance;isHermesCreate=true

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Storage

Storage type: General Purpose SSD (gp2)
Allocated storage: 20 GiB

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Screenshot of the AWS RDS console showing the creation of a MySQL database.

The top section shows the AWS Simple Monthly Calculator for estimating costs, with a note about the Amazon RDS Free Tier being available for 12 months. It lists free tier benefits: 750 hrs of Amazon RDS in a Single-AZ db.t2.micro, db.t3.micro or db.t4g.micro instance, 20 GB of General Purpose Storage (SSD), and 20 GB for automated backup storage and any user-initiated DB Snapshots. A link to "Learn more about AWS Free Tier" is provided.

A warning message states: "You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services."

The "Create database" button is highlighted in orange.

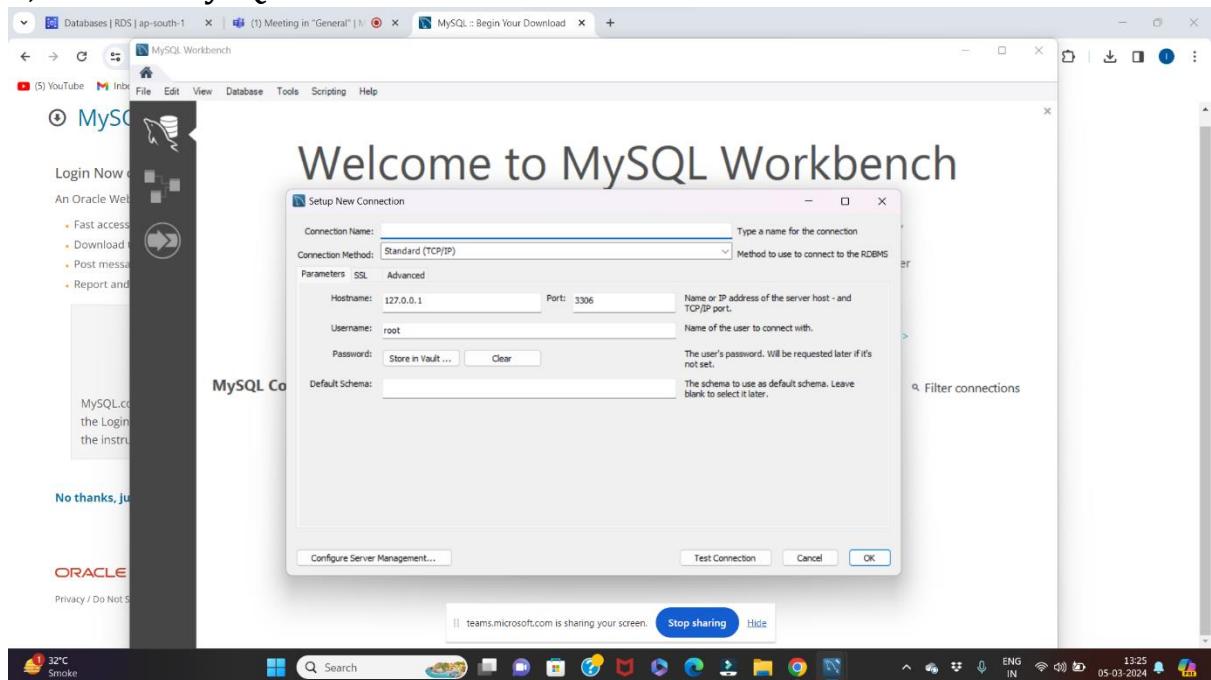
The bottom section shows the "Amazon RDS" dashboard with the "Databases" tab selected. A message indicates that the database might take a few minutes to launch and suggests using settings from the "ishitadatabase-1" cluster for add-ons. It also recommends creating a Blue/Green deployment to minimize downtime during upgrades.

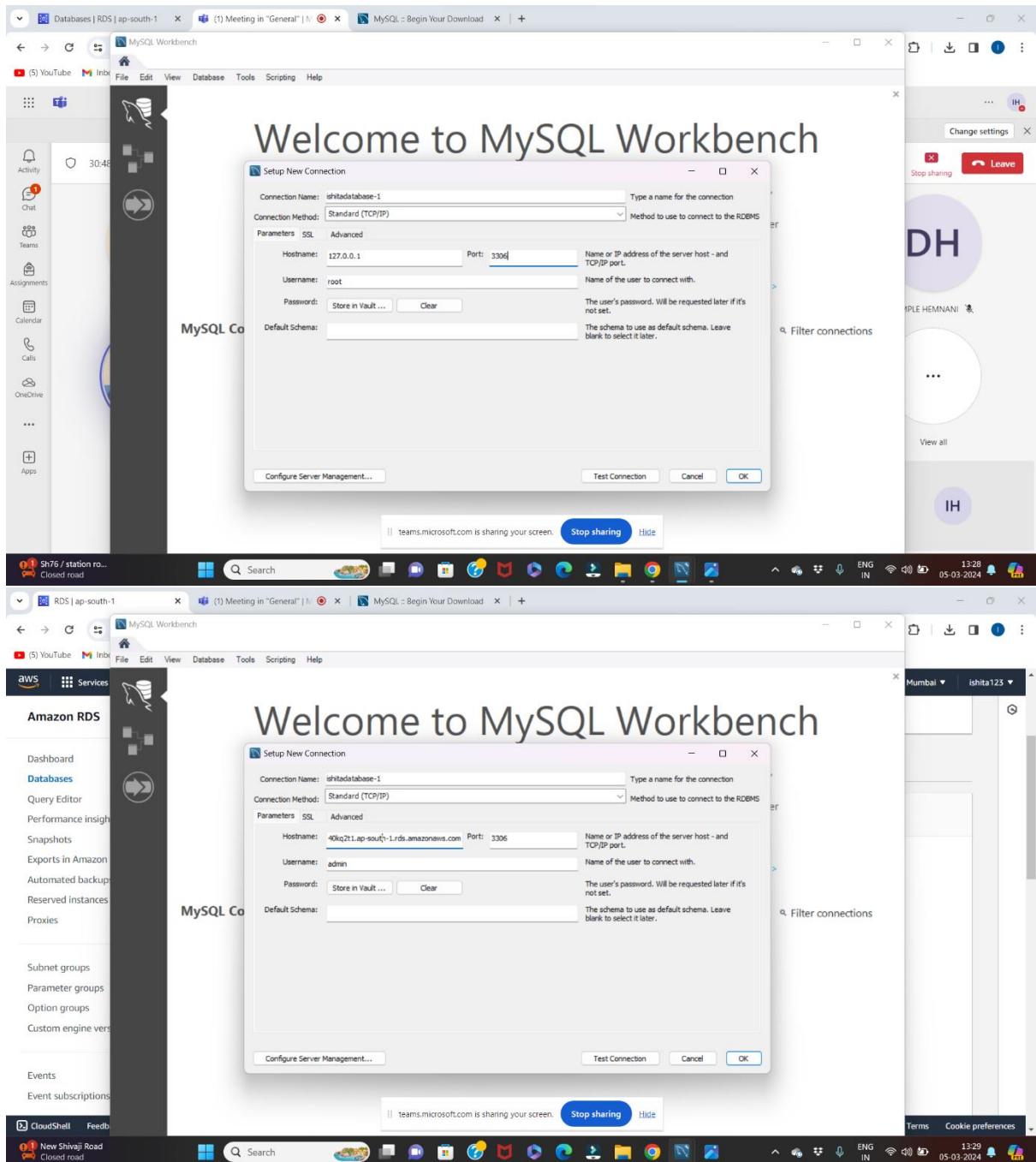
The "Databases" table shows one entry:

DB identifier	Status	Role	Engine	Region & AZ	Size	Recommendations	CPU
ishitadatabase-1	Creating	Instance	MySQL Community	-	db.t2.micro	-	-

The status bar at the bottom shows the date as 05-03-2024 and the time as 13:20.

2, Connect MySQL Workbench with the create database





3. Since there is error in connecting , change inbound rules

The screenshot shows the AWS EC2 Security Groups console. The left sidebar navigation includes:

- EC2 Dashboard
- EC2 Global View
- Events
- Instances
 - Instances
 - Instance Types
 - Launch Templates
 - Spot Requests
 - Savings Plans
 - Reserved Instances
 - Dedicated Hosts
 - Capacity Reservations
 - New
- Images
 - AMIs
 - AMI Catalog
- Elastic Block Store
 - Volumes
 - Snapshots

The main content area displays the details of the security group "sg-05e5c845680f2333d - default". The "Details" section shows:

Security group name	sg-05e5c845680f2333d	Description	VPC ID
Owner	339712761521	Inbound rules count	vpc-0e48dbf212e7fb6a3
		Outbound rules count	
		1 Permission entry	

The "Inbound rules" tab is selected, showing one rule:

Name	Security group rule...	Type	Protocol	Port range
teams.microsoft.com is sharing your screen.	Stop sharing	Hide		

The "Edit inbound rules" page shows the rule details:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-031bf7aecc90b26cf	All traffic	All	All	Custom	sg-05e5c845680f2333d

Buttons at the bottom include "Add rule", "Cancel", "Preview changes", and "Save rules".

Screenshot of the AWS CloudShell interface showing the configuration of an inbound security group rule.

The screenshot displays two windows side-by-side:

- Left Window (Top):** AWS CloudShell. The URL is `ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#ModifyInboundSecurityGroupRules;securityGroupId=sg-05e5c845680f2333d`. The page shows the "Edit inbound rules" section for a security group with ID `sg-05e5c845680f2333d`. It lists one rule: "sgr-031bf7aec90b26cf" (All traffic, All, All, Custom, sg-05e5c845680f2333d). A "Delete" button is visible next to the rule.
- Right Window (Bottom):** AWS CloudShell. The URL is the same as the left window. It shows the same "Edit inbound rules" page with the same rule listed. A "Delete" button is visible next to the rule.

A status bar at the bottom of both windows indicates "CloudShell Feedback" and "Feedback". The system tray shows "32°C Smoke" and "CloudShell". The taskbar includes icons for YouTube, Gmail, Google, Interview Warmup, Tutorials List - Java, WhatsApp, and Neumorphism/Soft... The system clock shows "13:38 05-03-2024".

SecurityGroup | EC2 | ap-south-1 | Meeting in "General" | MySQL : Begin Your Download | +

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Inbound security group rules successfully modified on security group (sg-05e5c845680f2333d | default)

EC2 Dashboard | EC2 Global View | Events

Instances | Instances | Instance Types | Launch Templates | Spot Requests | Savings Plans | Reserved Instances | Dedicated Hosts | Capacity Reservations | New

Images | AMIs | AMI Catalog

Elastic Block Store | Volumes | Snapshots

CloudShell Feedback

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Inbound security group rules successfully modified on security group (sg-05e5c845680f2333d | default)

EC2 > Security Groups > sg-05e5c845680f2333d - default

sg-05e5c845680f2333d - default

Actions ▾

Details

Security group name	sg-05e5c845680f2333d	Description	VPC ID
Owner	339712761521	Inbound rules count	vpc-0e48dbf212e7fb6a3
		2 Permission entries	
		Outbound rules count	
		1 Permission entry	

Inbound rules | Outbound rules | Tags

Inbound rules (2)

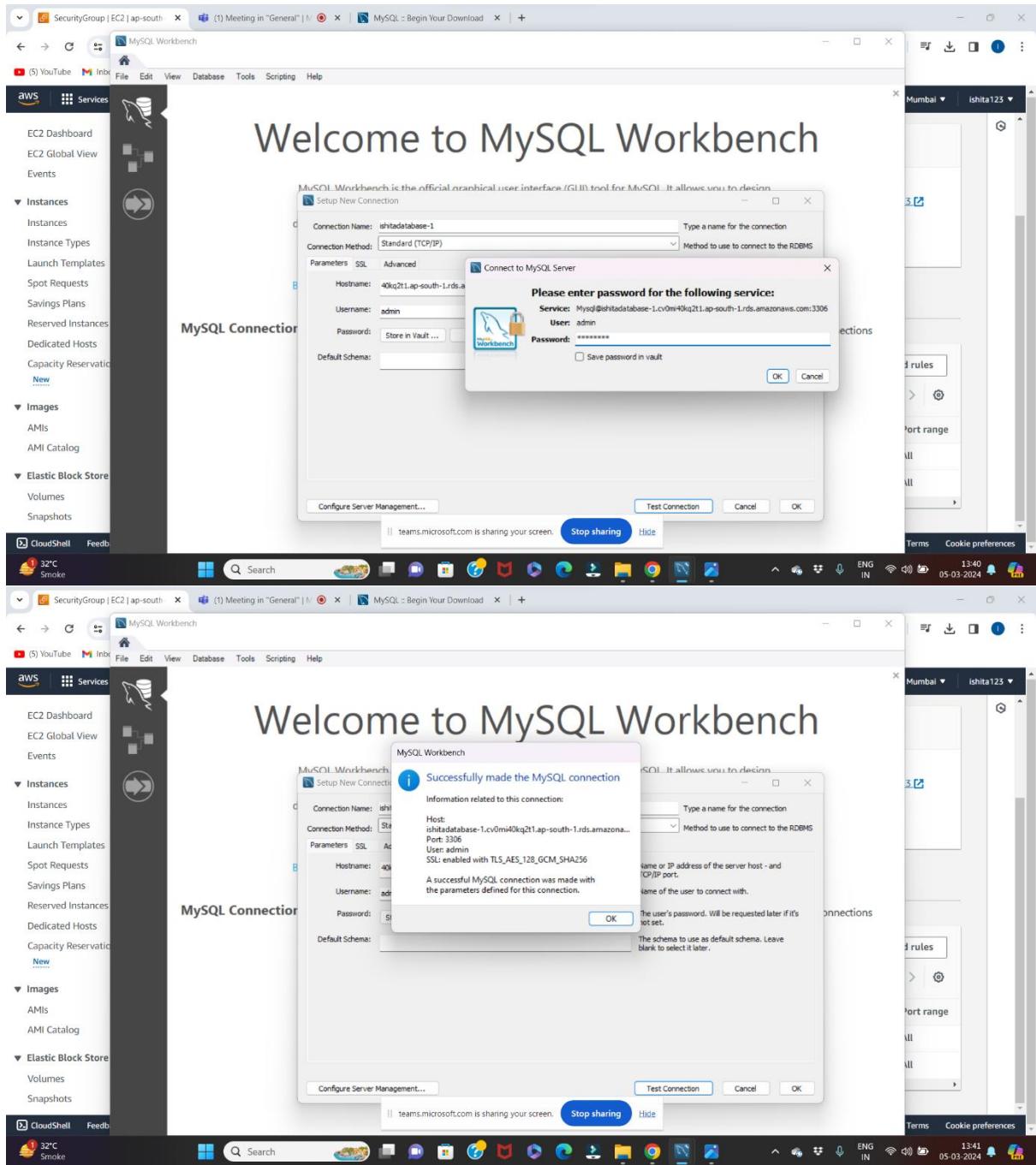
Search Stop sharing Hide

Name	Security group rule...	IP version	Type	Protocol	Port range
-	sgr-031bf7aec90b26cf	-	All traffic	All	All
-	sgr-0658795fdceb610f6	IPv4	All traffic	All	All

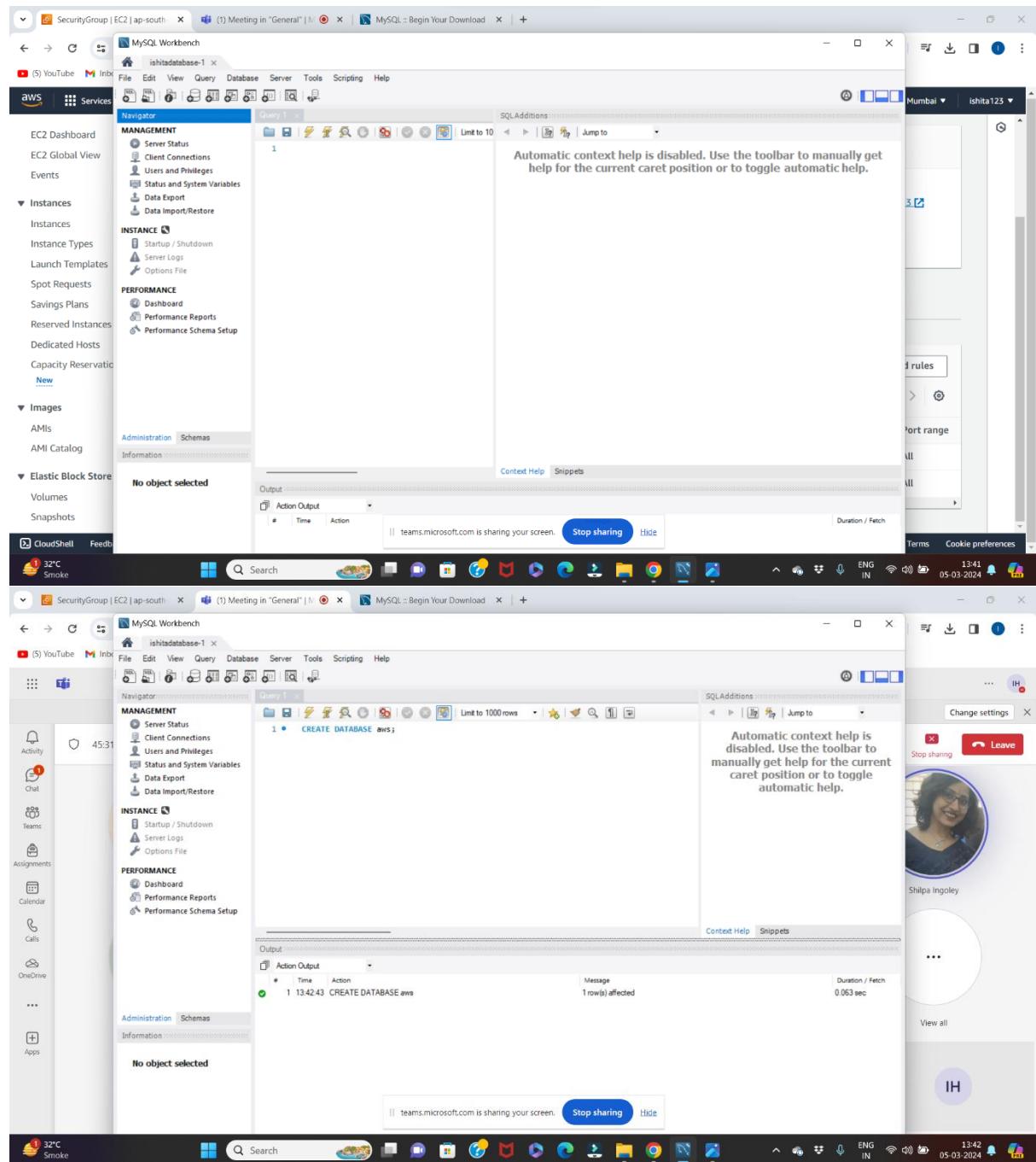
CloudShell Feedback

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4. Connection successful



5. Use the create database



The screenshot shows two instances of MySQL Workbench running side-by-side. Both instances are connected to a MySQL server named 'ishitadatabase-1'.

Top Window (Query Editor):

```
CREATE DATABASE aws;
USE aws;
```

Bottom Window (Query Editor):

```
USE aws;
SHOW tables;
CREATE TABLE Persons (
    PersonID int,
    LastName varchar(255),
    FirstName varchar(255),
    Address varchar(255),
    City varchar(255)
);
```

Output Log:

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual t... 0.328 sec	
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists 0.016 sec	
5	13:46:56	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255))	Error Code: 4028. A table must have at least one visible column. 0.000 sec	
6	13:47:51	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255))	0 row(s) affected 0.047 sec	

MySQL Workbench

ishitdatabase-1

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

Administration Schemas

No object selected

Query 1

```
8     Address varchar(255),
9     City varchar(255)
10    );
11
12 • DESC Persons;
```

Result Grid

Field	Type	Null	Key	Default	Extra
PersonID	int	YES	NO		
LastName	varchar(255)	YES	NO		
FirstName	varchar(255)	YES	NO		
Address	varchar(255)	YES	NO		
City	varchar(255)	YES	NO		

Result 1

Action Output

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual...	0.328 sec
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4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.016 sec
5	13:46:56	CREATE TABLE student	Error Code: 4028. Table must have at least one visible column.	0.000 sec
6	13:47:51	CREATE TABLE Persons (PersonID int,	Error Code: 4028. Table must have at least one visible column.	0.047 sec
7	13:48:56	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.015 sec
8	13:49:02	DESC Persons	5 row(s) returned	0.000 sec / 0.000 sec
9	13:51:13	INSERT INTO Persons (PersonID, LastName, FirstName, Address, City) VA...	4 row(s) affected Records: 4 Duplicates: 0 Warnings: 0	0.016 sec

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Change settings Stop sharing

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View all

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File Edit View Query Database Server Tools Scripting Help

ishitdatabase-1

51:45

Activity Chat Teams Assignments Calendar Calls OneDrive Apps

32°C Smoke

File Edit View Query Database Server Tools Scripting Help

ishitdatabase-1

54:08

Activity Chat Teams Assignments Calendar Calls OneDrive Apps

32°C Smoke

13:49 05-03-2024 ENG IN

13:51 05-03-2024 ENG IN

MySQL Workbench

ishitdatabase-1

File Edit View Query Database Server Tools Scripting Help

MANAGEMENT

- Server Status
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- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
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- Performance Schema Setup

Query 1

```
9 City varchar(255)
10 );
11
12 • DESC Persons;
13
14 • INSERT INTO Persons (PersonID, LastName, FirstName, Address, City)
15   VALUES ('1', 'Doe', 'John', '123 Main St', 'New York'),
16          ('2', 'Smith', 'Jane', '456 Oak St', 'Los Angeles'),
17          ('3', 'Johnson', 'Robert', '789 Pine St', 'Chicago'),
18          ('4', 'Williams', 'Emily', '987 Elm St', 'San Francisco');
19
20 • SELECT * FROM Persons;
```

Result Grid

PersonID	LastName	FirstName	Address	City
1	Doe	John	123 Main St	New York
2	Smith	Jane	456 Oak St	Los Angeles
3	Johnson	Robert	789 Pine St	Chicago
4	Williams	Emily	987 Elm St	San Francisco

Persons 2

No object selected

Action Output

#	Time	Action	Message	Duration / Fetch
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.016 sec
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Persons 2

No object selected

Action Output

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Change settings

Stop sharing

Leave

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13:51 05-03-2024

MySQL Workbench

ishitdatabase-1

File Edit View Query Database Server Tools Scripting Help

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1	Doe	John	123 Main St	New York
2	Smith	Jane	456 Oak St	Los Angeles
3	Johnson	Robert	789 Pine St	Chicago
4	Williams	Emily	987 Elm St	San Francisco

Persons 2

No object selected

Action Output

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual...	0.328 sec
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.016 sec
5	13:45:56	CREATE TABLE student	Error Code: 4028. A table must have at least one visible column.	0.000 sec
6	13:47:51	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255));	0 row(s) affected	0.047 sec

Persons 2

No object selected

Action Output

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual...	0.328 sec
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.016 sec
5	13:45:56	CREATE TABLE student	Error Code: 4028. A table must have at least one visible column.	0.000 sec
6	13:47:51	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255));	0 row(s) affected	0.047 sec
7	13:48:56	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.015 sec
8	13:49:02	DESC Persons	5 row(s) returned	0.000 sec / 0.000 sec
9	13:51:13	INSERT INTO Persons (PersonID, LastName, FirstName, Address, City) VALUES ('1', 'Doe', 'John', '123 Main St', 'New York');	4 row(s) affected Records: 4 Duplicates: 0 Warnings: 0	0.016 sec

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Change settings

Stop sharing

Leave

AJ

AN JETHWANI

IH

View all

32°C Smoke

13:52 05-03-2024

MySQL Workbench - ishitdatabase-1

Query 1

```
7 Firstname varchar(255),
8 Address varchar(255),
9 City varchar(255)
);
11
12 • DESC Persons;
```

Output

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual... 0.328 sec	
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.016 sec
5	13:46:56	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255));	Error Code: 4028. A table must have at least one visible column.	0.000 sec
6	13:47:51	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255));	1 row(s) affected	0.047 sec
7	13:48:56	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.019 sec
8	13:49:02	DESC Persons	5 row(s) returned	0.000 sec / 0.000 sec
9	13:51:13	INSERT INTO Persons (PersonID, LastName, FirstName, Address, City) VALUES (1, 'Doe', 'John', '123 Main St', 'New York'), (2, 'Smith', 'Jane', '456 Oak St', 'Los Angeles'), (3, 'Johnson', 'Robert', '789 Pine St', 'Chicago'), (4, 'Williams', 'Emily', '987 Elm St', 'San Francisco');	4 row(s) affected Records: 4 Duplicates: 0 Warnings: 0	0.016 sec
10	13:51:55	SELECT * FROM Persons LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
11	13:53:49	UPDATE Persons SET FirstName='Ishita', City = 'Frankfurt' WHERE CustomerID = 4;	Error Code: 1054. Unknown column 'CustomerID' in 'where clause'	0.000 sec
12	13:54:19	UPDATE Persons SET FirstName='Ishita', City = 'Frankfurt' WHERE PersonID = 4;	Error Code: 1175. You are using safe update mode and you tried to update a field that cannot be updated	0.000 sec

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

MySQL Workbench - ishitdatabase-1

Query 1

```
7 Firstname varchar(255),
8 Address varchar(255),
9 City varchar(255)
);
11
12 • DESC Persons;
```

Output

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual... 0.328 sec	
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.016 sec
5	13:46:56	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255));	Error Code: 4028. A table must have at least one visible column.	0.000 sec
6	13:47:51	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255));	1 row(s) affected	0.047 sec
7	13:48:56	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.019 sec
8	13:49:02	DESC Persons	5 row(s) returned	0.000 sec / 0.000 sec

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Screenshot of MySQL Workbench showing a database named "ishitadb-1". The SQL Editor tab contains the following code:

```
Persons (PersonID, LastName, FirstName, Address, City)
VALUES ('Doe', 'John', '123 Main St', 'New York'),
       ('Smith', 'Jane', '456 Oak St', 'Los Angeles'),
       ('Johnson', 'Robert', '789 Pine St', 'Chicago'),
       ('Williams', 'Emily', '987 Elm St', 'San Francisco');

SELECT * FROM Persons;

UPDATE Persons
SET FirstName= 'Ishita', City = 'Frankfurt'
WHERE PersonID = 4;
```

The Output tab shows the results of the queries:

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual... 0.328 sec	
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists 0.016 sec	
5	13:46:56	CREATE TABLE student (Error Code: 4028. A table must have at least one visible column. 0.000 sec	
6	13:47:51	CREATE TABLE Persons (PersonID int, LastName varchar(255), FirstName varchar(255), Address varchar(255), City varchar(255))	0 row(s) affected 0.047 sec	

The SQLAdditions panel displays a message about automatic context help being disabled.

Screenshot of MySQL Workbench showing the Preferences dialog for the SQL Editor tab. The "General Editors" section is selected, with "Auto-save scripts interval" set to 10 seconds. Other settings include "Create new tabs as Query tabs instead of File" (unchecked) and "Restore expanded state of the active schema objects" (checked). The "Sidebars" section has "Show Schema Contents in Schema Tree" checked. The "MySQL Session" section shows DBMS connection parameters. The "Other" section includes "Internal Workbench Schema" set to ".mysqlworkbench" and "Safe Updates (rejects UPDATEs and DELETEs with no restrictions)" checked.

The Output tab shows the results of the queries again.

The screenshot shows two instances of MySQL Workbench running side-by-side. Both instances have the same interface, with the left one being the primary focus.

Left Instance (Focused):

- Navigator:** Shows 'No object selected'.
- Query Editor:** Contains the following SQL statements:

```
5 13:46:56 CREATE TABLE student
6 13:47:51 CREATE TABLE Persons ( PersonID int, LastName varchar(255), ... )
```
- Workbench Preferences:** Set to auto-save every 10 seconds. Includes options for creating tabs as Query instead of files, restoring expanded state, and sidebar settings like 'Show Schema Contents in Schema Tree'. It also includes MySQL session and other configuration options.

Right Instance (Background):

- Navigator:** Shows 'No object selected'.
- Query Editor:** Contains the following SQL statement:

```
11 13:47:51 DESC Persons
```
- Output:** Displays the results of the DESCRIBE command for the Persons table, listing columns and their properties.

System Status: Both instances show a system tray with a 32°C temperature reading, a smoke icon, and a date/time stamp of 05-03-2024.

This screenshot shows the MySQL Workbench interface. The main window displays a query log titled 'Action Output' with 22 entries. The log includes actions like creating databases, using databases, creating tables, inserting data into 'Persons', selecting data from 'Persons', and setting SQL_SAFE_UPDATES. Most entries result in errors due to database creation conflicts. A sharing overlay from 'AN JETHWANI' is visible on the right, showing profile pictures for 'AJ' and 'IH'.

#	Time	Action	Message	Duration / Fetch
1	13:42:43	CREATE DATABASE aws	1 row(s) affected	0.063 sec
2	13:43:07	USE DATABASE aws	Error Code: 1064. You have an error in your SQL syntax; check the manual...	0.328 sec
3	13:43:16	USE aws	0 row(s) affected	0.000 sec
4	13:43:50	CREATE DATABASE aws	Error Code: 1007. Can't create database 'aws'; database exists	0.016 sec
5	13:46:56	CREATE TABLE student (PersonID int, LastName varchar(255), ...)	Error Code: 4028. A table must have at least one visible column.	0.000 sec
6	13:47:51	CREATE TABLE Persons (PersonID int, FirstName varchar(50), LastName varchar(50), Address varchar(150), City varchar(50))	Error Code: 1007. Can't create database 'aws'; database exists	0.015 sec
7	13:49:02	DESC Persons	5 row(s) returned	0.000 sec / 0.000 sec
8	13:51:13	INSERT INTO Persons (PersonID, LastName, FirstName, Address, City) VALUES (1, 'Ishita', 'Ishita', '123 Main St.', 'New York')	4 row(s) affected Records: 4 Duplicates: 0 Warnings: 0	0.016 sec
9	13:51:55	SELECT * FROM Persons LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
10	13:53:49	UPDATE Persons SET FirstName='Ishita', City = 'Frankfurt' WHERE PersonID = 1	Error Code: 1054. Unknown column 'CustomerID' in 'where clause'	0.000 sec
11	13:54:19	UPDATE Persons SET FirstName='Ishita', City = 'Frankfurt' WHERE PersonID = 1	Error Code: 1175. You are using safe update mode and you tried to update ...	0.000 sec
12	13:56:34	UPDATE Persons SET FirstName='Ishita', City = 'Frankfurt' WHERE PersonID = 1	Error Code: 1175. You are using safe update mode and you tried to update ...	0.016 sec
13	13:57:09	USE aws	0 row(s) affected	0.000 sec
14	13:57:21	UPDATE Persons SET FirstName='Ishita', City = 'Frankfurt' WHERE PersonID = 1	Error Code: 1175. You are using safe update mode and you tried to update ...	0.015 sec
15	14:00:34	SET SQL_SAFE_UPDATES = 0	0 row(s) affected	0.000 sec
16	14:00:34	update Persons set FirstName = 'Ishita' where PersonID=4	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.015 sec
17	14:00:34	SET SQL_SAFE_UPDATES = 1	0 row(s) affected	0.016 sec
18	14:00:34	DELETE FROM Persons WHERE PersonID = 2	Error Code: 1175. You are using safe update mode and you tried to update ...	0.000 sec
19	14:02:23	SET SQL_SAFE_UPDATES = 0	0 row(s) affected	0.015 sec
20	14:02:23	DELETE FROM Persons WHERE PersonID = 2	1 row(s) affected	0.000 sec
21	14:02:23	SET SQL_SAFE_UPDATES = 1	0 row(s) affected	0.016 sec
22	14:02:23	SET SQL_SAFE_UPDATES = 1	0 row(s) affected	0.016 sec

This screenshot shows the MySQL Workbench interface. The main window displays a query editor with a SQL script. The script creates a database 'aws', creates a table 'student', inserts data into 'Persons', and performs several UPDATE operations on 'Persons'. It also sets SQL_SAFE_UPDATES to 0 and 1. An error message is shown in the status bar: 'Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.' A sharing overlay from 'AN JETHWANI' is visible on the right, showing profile pictures for 'AJ' and 'IH'.

```
VALUES (1, 'Oren', 'John', '123 Main St.', 'New York'),  
(2, 'Smith', 'Jane', '456 Oak St.', 'Los Angeles'),  
(3, 'Johnson', 'Robert', '789 Pine St.', 'Chicago'),  
(4, 'Williams', 'Emily', '987 Elm St.', 'San Francisco');  
SELECT * FROM Persons;  
UPDATE Persons  
SET FirstName= 'Ishita', City = 'Frankfurt'  
WHERE PersonID = 1;  
SET SQL_SAFE_UPDATES = 0;  
update Persons set FirstName = 'Ishita' where PersonID=1;  
SET SQL_SAFE_UPDATES = 1;  
SET SQL_SAFE_UPDATES = 0;  
DELETE FROM Persons WHERE PersonID = 2;  
SET SQL_SAFE_UPDATES = 1;
```

The screenshot shows the AWS RDS (Relational Database Service) console. On the left, there's a navigation sidebar with options like Dashboard, Databases (which is selected), Query Editor, Performance insights, Snapshots, Exports in Amazon S3, Automated backups, Reserved instances, Proxies, Subnet groups, Parameter groups, Option groups, Custom engine versions, Events, and Event subscriptions. The main content area is titled 'RDS > Databases'. It shows a table with one row:

DB identifier	Status	Role	Engine	Region & AZ	Size	Recommendations
ishitadatabase-1	Available	Instance	MySQL Community	ap-south-1b	db.t2.micro	

A context menu is open over the 'ishitadatabase-1' row, listing the following actions:

- Quick Actions - New
- Convert to Multi-AZ deployment
- Stop temporarily
- Reboot
- Delete
- Set up EC2 connection
- Set up Lambda connection
- Create read replica
- Create Aurora read replica
- Create Blue/Green Deployment - new
- Promote
- Take snapshot
- Restore to point in time
- Migrate snapshot
- Create RDS Proxy
- Create ElastiCache cluster - new

The browser status bar at the bottom indicates the URL is ap-south-1.console.aws.amazon.com/rds/home?region=ap-south-1#databases, and the system status bar shows 'CloudShell Feedback' and network connectivity information.

The screenshot shows two overlapping dialog boxes on the AWS RDS console.

Top Dialog: Stop DB instance temporarily

This dialog is titled "Stop DB instance temporarily". It contains the following text:
"You are stopping this DB instance for up to 7 days. You can restart the DB instance manually at any time. To stop the DB instance permanently, save it in a snapshot and delete it. [Learn more](#)"

Below this, there is an "Acknowledgement" section with a checked checkbox: "I acknowledge that the DB instance will restart automatically after 7 days, on March 12, 2024, 14:05 (UTC+05:30)".

There is also a "Snapshot - optional" section with an unchecked checkbox: "Save the DB instance in a snapshot". A note below it says: "The snapshot enables you to restore the DB instance to its last state before it was stopped."

At the bottom right of the dialog are "Cancel" and "Stop temporarily" buttons.

Bottom Dialog: Delete ishitadatabase-1 instance

This dialog is titled "Delete ishitadatabase-1 instance". It contains the following text:
"Permanently delete ishitadatabase-1 DB instance. You can't undo this action."

It includes a warning message: "⚠ Proceeding with this action will delete the instance with all its content and can affect related resources. [Learn more](#)".

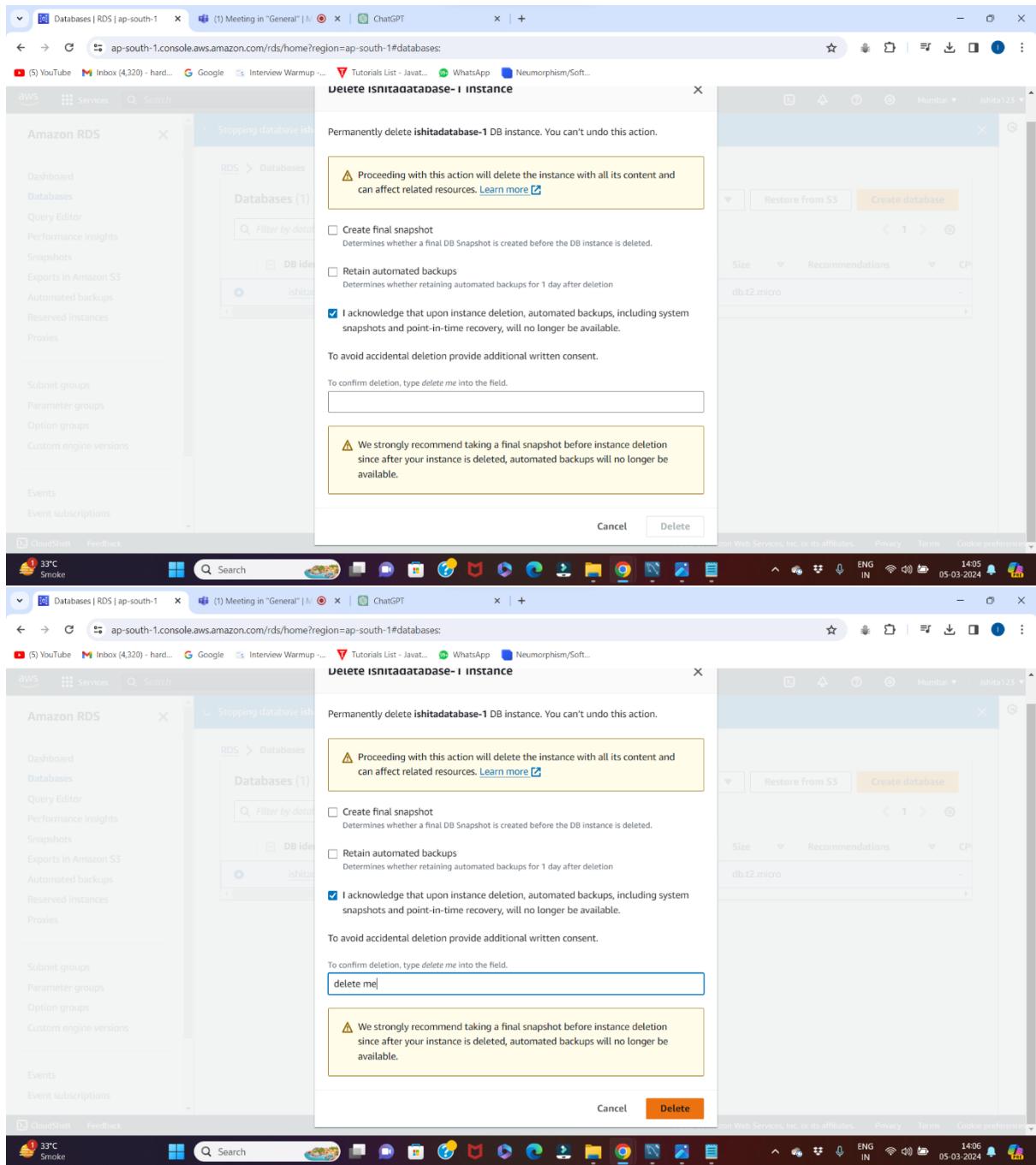
Checkboxes for options are present:

- Create final snapshot: "Determines whether a final DB Snapshot is created before the DB instance is deleted."
- Final snapshot name: "The identifier of the new DB snapshot that is created." A field is filled with "ishitadatabase-1-snapshot".
- Retain automated backups: "Determines whether retaining automated backups for 1 day after deletion"

A note in a box states: " ⓘ You will be billed for retained backup storage at the rate described as 'Additional backup storage' found in [Backup Storage](#).

Below the checkboxes, there is a note: "To avoid accidental deletion provide additional written consent." followed by a text input field containing "Delete me".

At the bottom right of the dialog are "Cancel" and "Delete" buttons.



Screenshot of the AWS RDS console showing the deletion of a DB instance.

The browser window title is "Databases | RDS | ap-south-1". The URL is "ap-south-1.console.aws.amazon.com/rds/home/?region=ap-south-1#databases".

The AWS RDS sidebar navigation includes:

- Dashboard
- Databases** (selected)
- Query Editor
- Performance insights
- Snapshots
- Exports in Amazon S3
- Automated backups
- Reserved instances
- Proxies

The main content area shows a confirmation message: "Stopping database ishitadatabase-1 is in progress". Below it, a modal dialog says "Deleting DB instance ishitadatabase-1".

The "Databases" table lists one instance:

DB identifier	Status	Role	Engine	Region & AZ	Size	Recommendations	CPU
ishitadatabase-1	Deleting	Instance	MySQL Community	ap-south-1b	db.t2.micro		

A Snipping Tool window is open, capturing the screenshot, with the message "Screenshot copied to clipboard and saved".

The status bar at the bottom shows "© 2024, Amazon Web Services, Inc. or its affiliates." and "CloudShell Feedback".

The taskbar shows various pinned icons and the system tray indicates the date as "05-03-2024".

After the deletion, the screen shows a success message: "Successfully deleted DB instance ishitadatabase-1". The database table now shows "No instances found".