Use SQL Server Express on AWS RDS for better security

Advantage:

1) Replaces a local version therefore user doesn't need to download and install SQL Server Express
2) S3, AWS credentials are being protected remotely
3) The application related database "olink" and the tables will be automatically created in AWS RDS

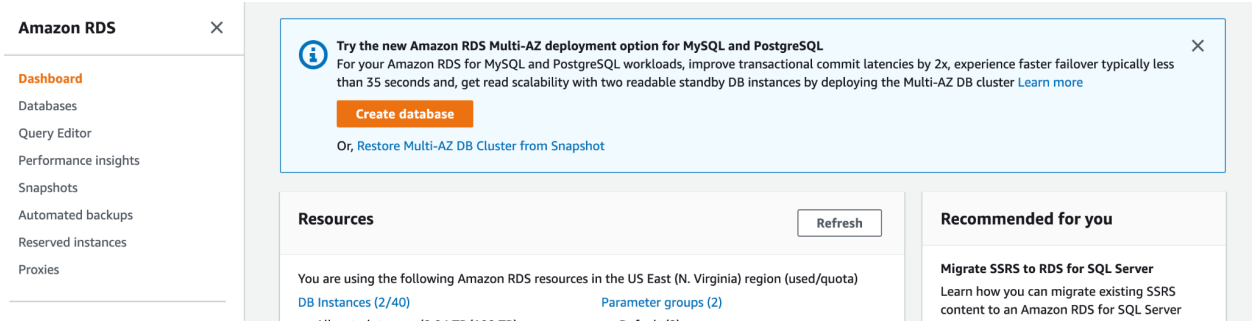
For Root User (administrator of AWS account) to create S3 & RDS:

Create a user (e.g "user1").

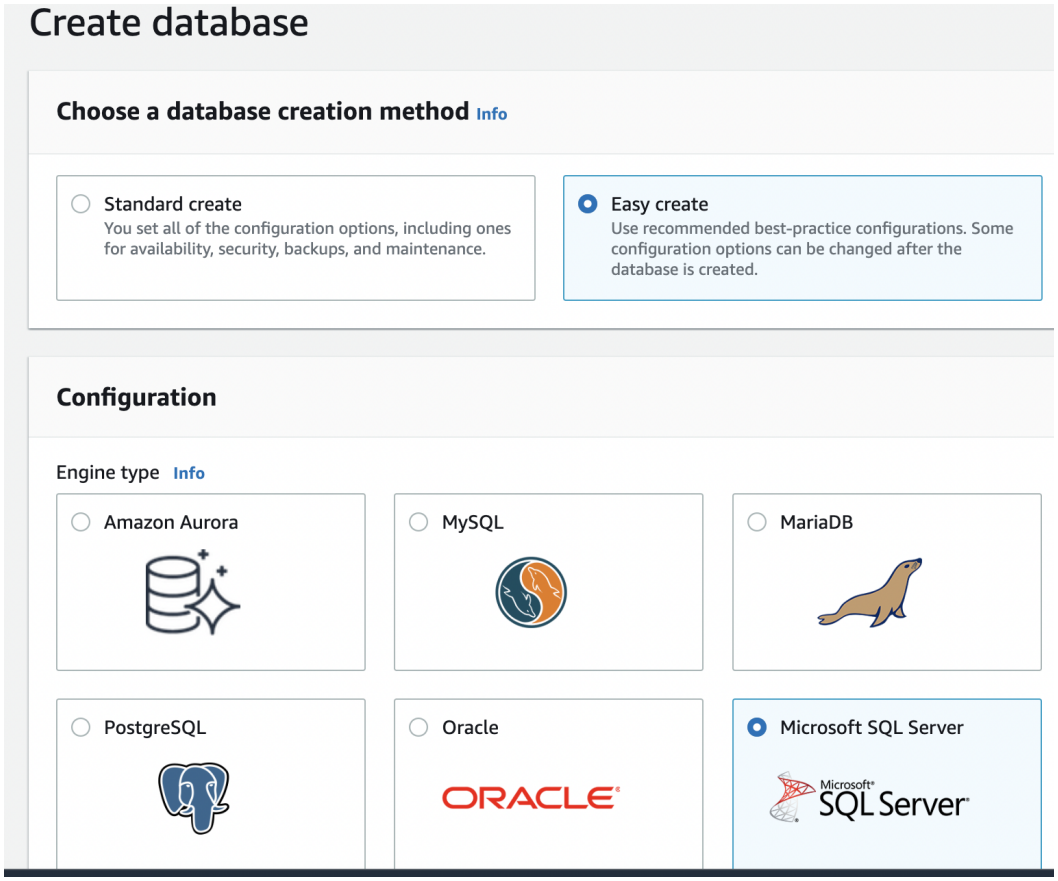
Create a database server after the user name attaching a suffix ("-RDS", default on the form).

Create a S3 bucket after the user name attaching a suffix ("-S3", default on the form).

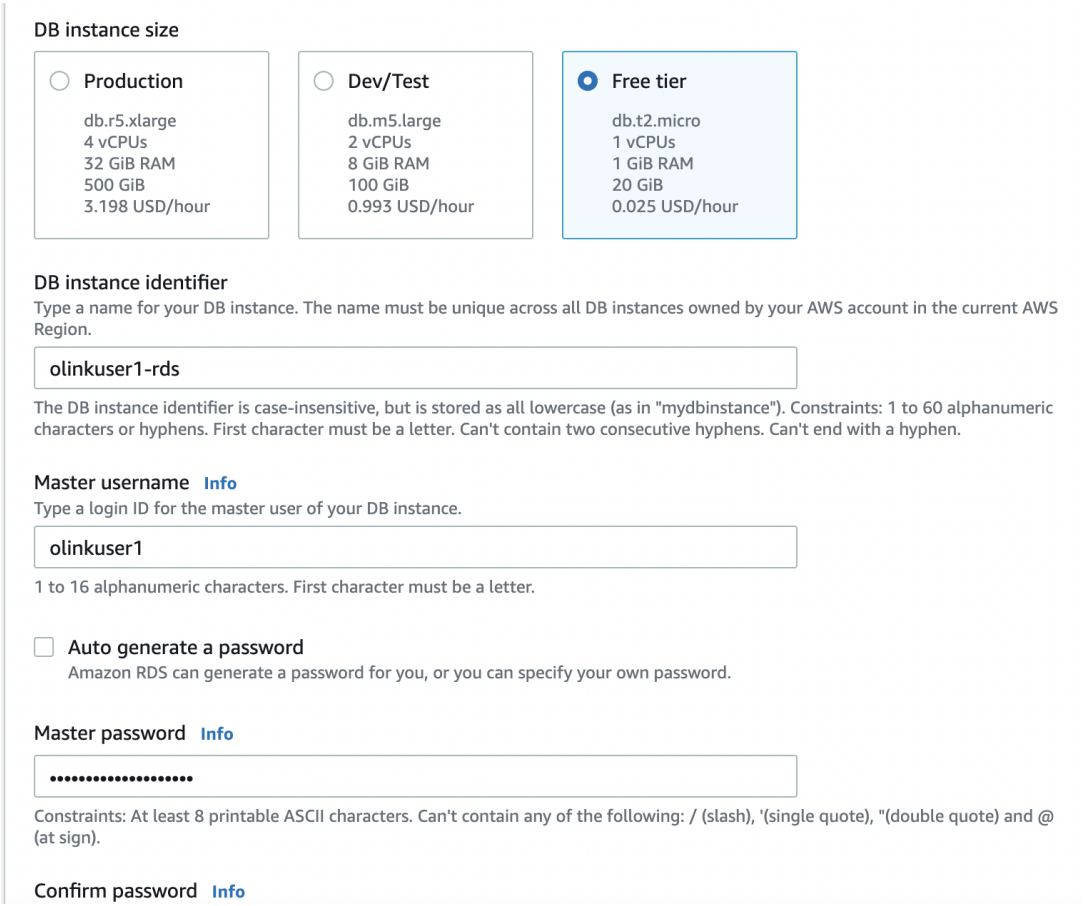
How to Create Database Server (naming rule: [username] + "-RDS")



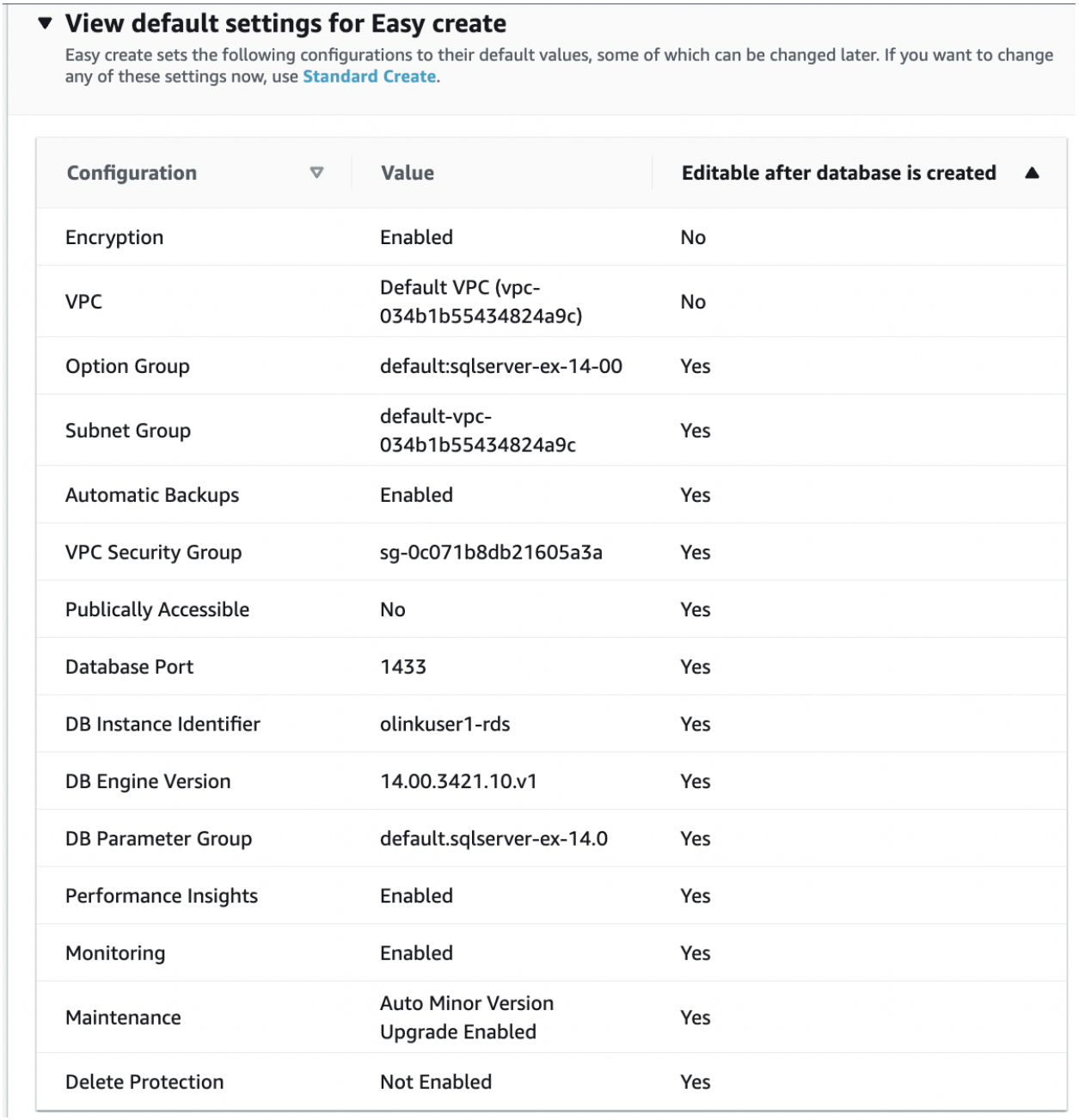
Select “Easy Create” in “Choose a database creation method”. In Configuration, choose “MS SQL Server”.



Select “Free Tier” in “DB instance size”. Select “DB instance identifier”. Name it “olinkuser1-rds”, S3 user name plus suffix “-rds”. Choose a Master password as you like or let AWS auto-generate it for you, by checking “Auto generate a password”. Click “Create Database” button to save.



Here is a snapshot of the “Easy Create” configuration of the newly created RDS instance.



View default settings for Easy create

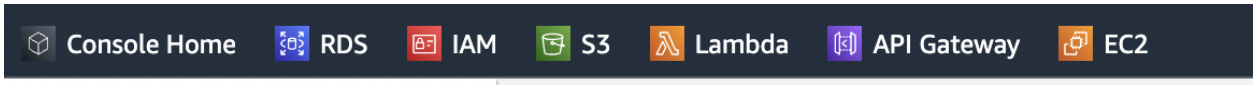
Easy create sets the following configurations to their default values, some of which can be changed later. If you want to change any of these settings now, use **Standard Create**.

Configuration	Value	Editable after database is created
Encryption	Enabled	No
VPC	Default VPC (vpc-034b1b55434824a9c)	No
Option Group	default:sqlserver-ex-14-00	Yes
Subnet Group	default-vpc-034b1b55434824a9c	Yes
Automatic Backups	Enabled	Yes
VPC Security Group	sg-0c071b8db21605a3a	Yes
Publically Accessible	No	Yes
Database Port	1433	Yes
DB Instance Identifier	olinkuser1-rds	Yes
DB Engine Version	14.00.3421.10.v1	Yes
DB Parameter Group	default.sqlserver-ex-14.0	Yes
Performance Insights	Enabled	Yes
Monitoring	Enabled	Yes
Maintenance	Auto Minor Version Upgrade Enabled	Yes
Delete Protection	Not Enabled	Yes

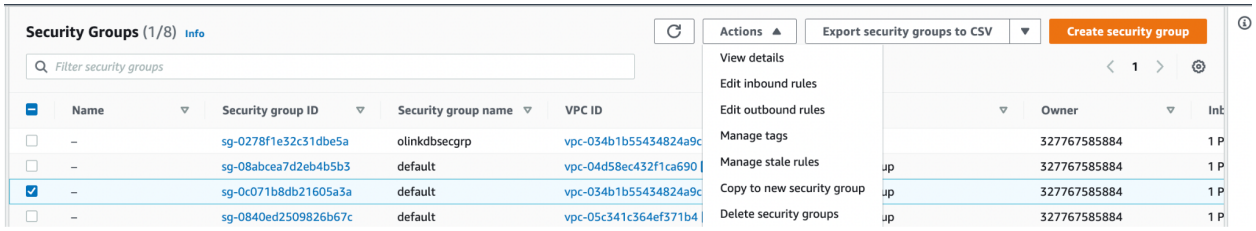
Here is a YT video reference, if the steps are not clear.
https://www.youtube.com/watch?v=vp_uulb5phM

Wait until this message is gone: “Your database might take a few minutes to launch” message is gone. If you have chosen to let AWS generate password for you, Click “Credential Details” for password and username.

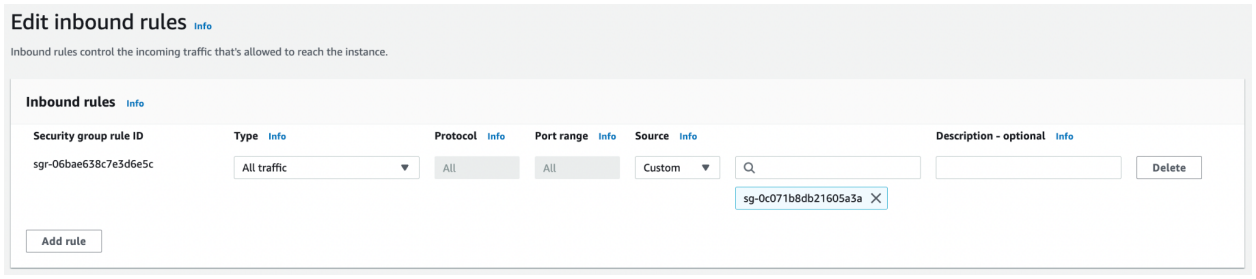
Please note a VPC security group is created for you (e.g. “sg-xxxxxa3a” in the above screenshot). Go to EC2 (from Search, ShortCut, or Consol Home)



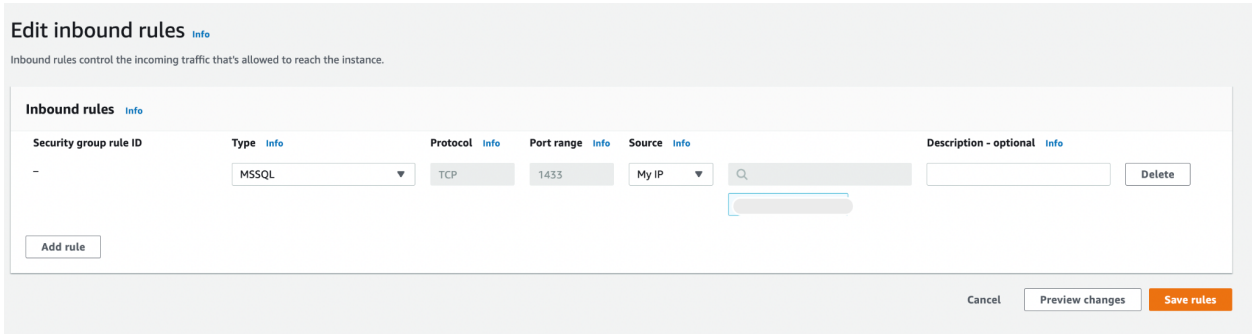
On the left scrollable menu, under “Network & Security” select “Secuirty Groups”. Select the default security group created for the RDS instance and select “Edit inbound rules” under “Actions” dropdown list.



Delete the default rule.



Click “Add rule” button at the left bottom. Choose MSSQL in the Type list and Select “My IP” in the Source list. The click “Save rules”.



Back in the Amazon RDS console, Choose Databases from the navigation pane, and then select the DB instance.
Choose Modify. Under Connectivity, extend the Additional configuration section, and then choose Publicly accessible.
Choose Continue. Choose Modify DB Instance.
Select “Publically Accessible”. Click “Continue” and select “Apply Immediately” and “Modify DB instance”

Connectivity

DB Subnet group

default-vpc-034b1b55434824a9c

Security group

List of DB security groups to associate with this DB instance.

Choose security groups

default

Certificate authority

rds-ca-2019

Additional configuration

Public access

- Publicly accessible
  RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.
- Not publicly accessible
  No IP address is assigned to the DB instance. EC2 instances and devices outside the VPC can't connect.

Database port

Specify the TCP/IP port that the DB instance will use for application connections. The application connection string must specify the port number. The DB security group and your firewall must allow connections to the port. **Learn more**

1433

Modify DB instance: olinkuser1-rds

Summary of modifications

You are about to submit the following modifications. Only values that will change are displayed. Carefully verify your changes and click Modify DB Instance.

Attribute	Current value	New value
Public accessibility	No	Yes

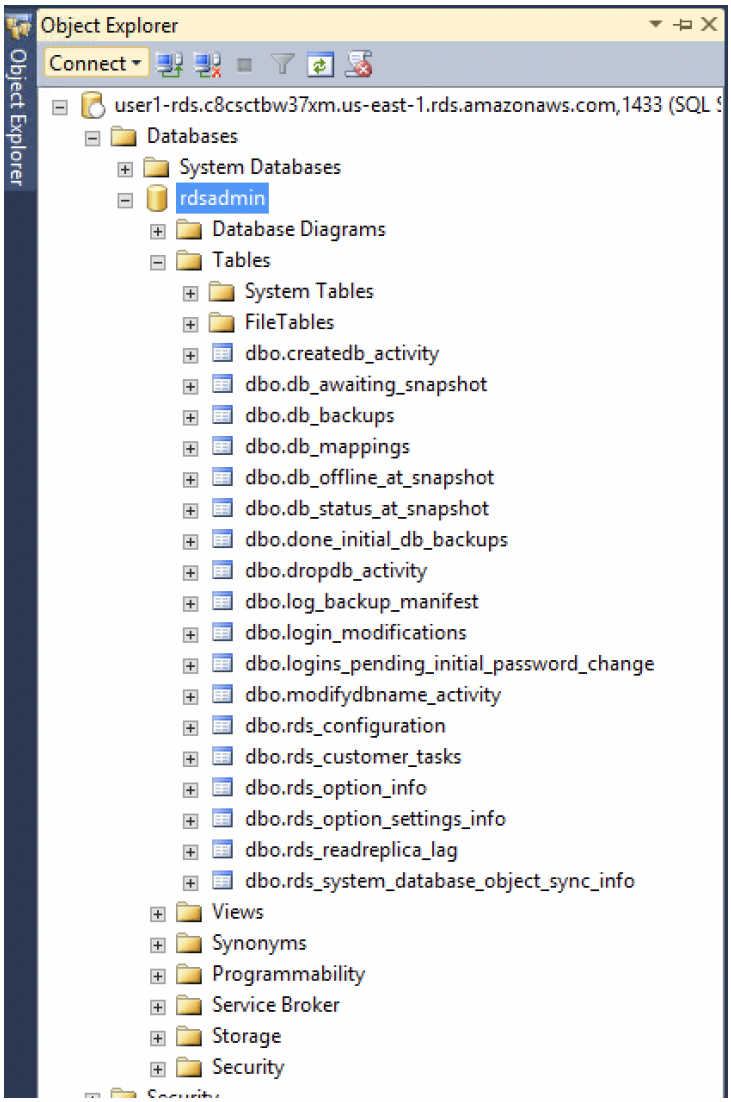
Scheduling of modifications

When to apply modifications

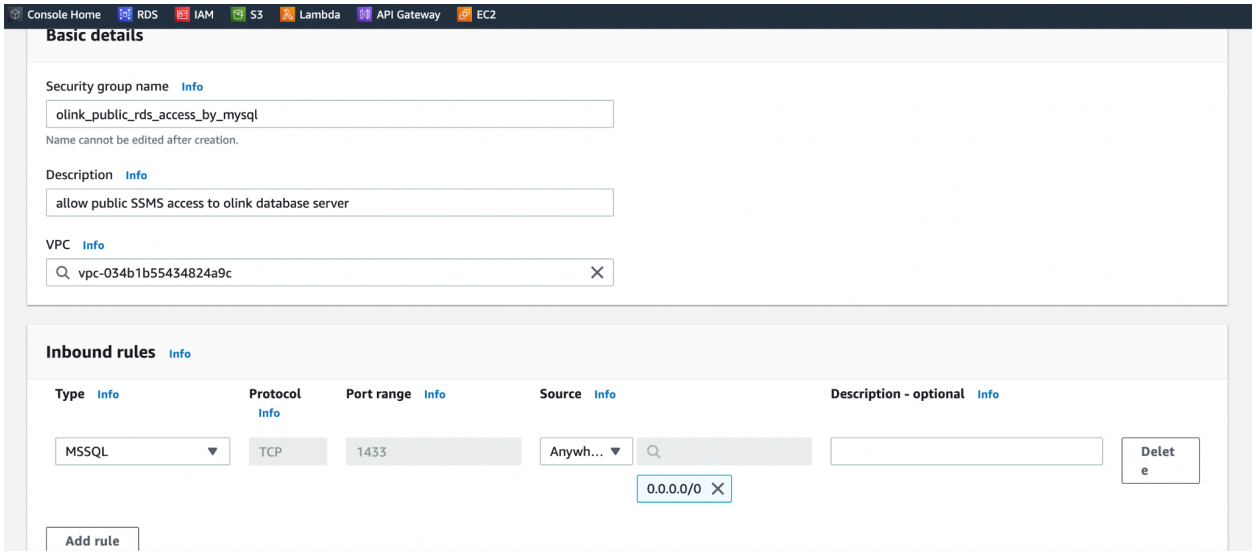
- Apply during the next scheduled maintenance window
  Current maintenance window: September 08, 2022 03:20 - 03:50 UTC-7
- Apply immediately
  The modifications in this request and any pending modifications will be asynchronously applied as soon as possible, regardless of the maintenance window setting for this database instance.

Cancel | Back | Modify DB instance

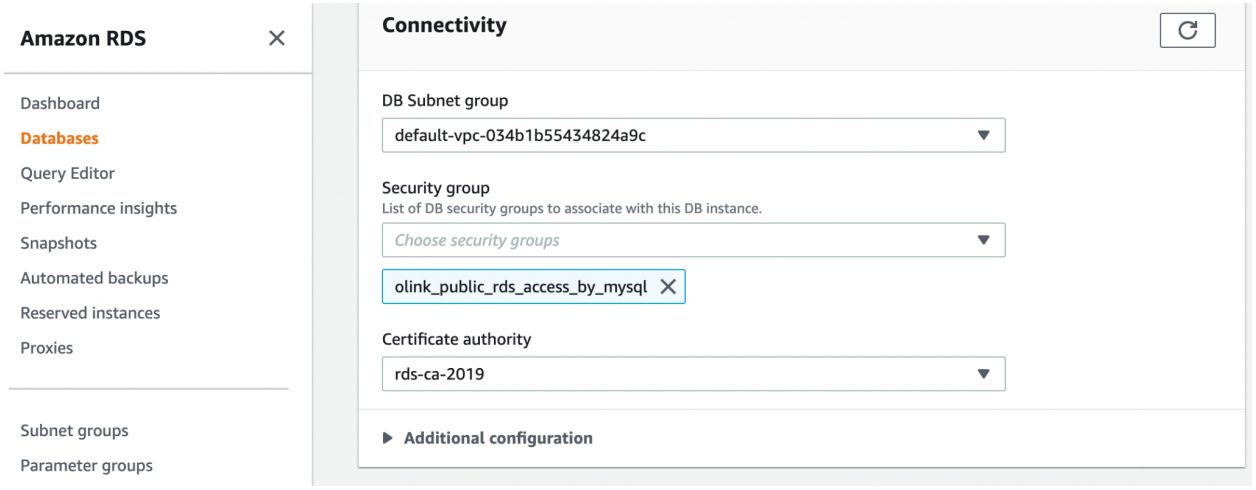
At this point, you should be able to access the DB Instance in SSMS. There is a pre-existing database “rdsadmin”. See the screenshot below.



If you wish to customize your security group, please follow the steps below. It'd better to understand the AWS networks before doing it.



In RDS console, select the DB Instance you want to edit and click "Modify" button. Choose the security group just added (e.g. olink_public_rds_access_by_mysql).



Edit the "Inbound Rule" of a Security Group and set the ip to the user computer. No more MSSQL server access from other machines.

Application automatically creates the "olink" database and its tables if doesn't exist. Message will appear to confirm the existence.