QATIP Intermediate Azure Lab08 Deploy Azure RDBMS

Contents

Overview

This exercise is designed to help you build an Azure SQL Server 2022 Standard virtual machine using Terraform. You will be provided with a skeleton Terraform file, and your task is to complete the missing sections by following the instructions.

By the end of this exercise, you will:

- Understand how to define and configure an Azure resource group.
- Create a virtual network and subnet for your SQL Server VM.
- Assign a public IP and configure networking for the VM.
- Deploy a Windows VM with SQL Server 2022 Standard Edition.
- Implement security rules to allow RDP and SQL access.
- Upload and restore a sample database backup (demo.bak).
- Output the public IP of the deployed VM.

Before you begin

Ensure you have completed Lab0 before attempting this lab.

In the IDE terminal pane, enter the following command...

cd c:\azure-tf-int\lab\08

This shifts your current working directory to labs\08. Ensure all commands are executed in this directory

Close any open files and use the Explorer pane to navigate to and open the labs\08 folder.

Solution

There are no step-by-step instructions for this lab. A solution can be at c:\azure-tf-int\labs\solutions\08 but try to use this only as a last resort if you are struggling to complete the steps outlined below.

Reference Documentation

Terraform Azure Provider Documentation (Version 4.18.0):
https://registry.terraform.io/providers/hashicorp/azurerm/4.18.0/docs

Azure Virtual Machines: https://learn.microsoft.com/en-us/azure/virtual-machines/

SQL Server on Azure VM: https://learn.microsoft.com/en-us/azure-sql/virtual-machines/windows/sql-server-on-azure-vm-overview

Scenario

You are working as a cloud engineer responsible for setting up a SQL Server 2022 Standard instance on Azure. The company requires a cost-effective solution using a small virtual machine size while ensuring secure access via RDP and SQL ports.

Your goal is to:

- Define the Azure infrastructure components in Terraform.
- Deploy a Windows-based VM with SQL Server 2022 Standard Edition.
- Configure network security settings to allow controlled access.
- Upload and restore a sample database backup (demo.bak) from the Terraform root directory.
- Extract and display the public IP of the virtual machine.

Instructions

You are provided with a partial Terraform script that includes only the **Provider** and **Resource Group** definitions in **c:\azure-tf-in\labs\09**. Your task is to complete the missing sections:

Step 1: Virtual Network and Subnet

- Create a **Virtual Network** (azurerm_virtual_network) named **vnet-sql**.
- Assign the address space **10.0.0.0/16**.
- Create a **Subnet** (azurerm_subnet) named **subnet-sql** with address prefix **10.0.1.0/24**.

Step 2: Public IP and Network Interface

- Create a Public IP Address (azurerm_public_ip) named sql-public-ip with Standard SKU, Static allocation.
- Create a **Network Interface** (azurerm_network_interface) named **sql-nic**.
- Associate the Public IP with the Network Interface.

Step 3: Virtual Machine

- Create a **Windows Virtual Machine** (azurerm_windows_virtual_machine) named **sql-server-vm**.

- Set the VM size to **Standard_B2s**.

- Define an **OS Disk** inside the VM block with:

  - Size: **32GB**

  - Type: Standard_LRS

- Use the SQL Server 2022 Standard Edition image with:

  - **Publisher**: MicrosoftSQLServer

  - **Offer**: sql2022-ws2022

  - **SKU**: standard-gen2

  - **Version**: latest

- Set administrator credentials (username: adminuser, password: your_choice).

Step 4: Security Rules

- Create a **Network Security Group (NSG)** (azurerm_network_security_group) named **sql-nsg**.

- Add a **Security Rule** (azurerm_network_security_rule) to allow **RDP (port 3389) from any IP**.

- Add a **Security Rule** (azurerm_network_security_rule) to allow **SQL Server (port 1433) from any IP**.

- Associate the NSG with the **Subnet**.

Step 5: Output the Public IP Address

- Modify the **Output block** (output) to print the public IP address of the VM.

Step 6: Deploy the resources

- Once you have completed all the sections, apply the Terraform configuration by running:
  - terraform init
  - terraform apply -auto-approve

Step 7: Upload and Restore Database Backup

- Retrieve the VM Public IP from Terraform output.

- Use RDP to connect to the VM:

  - Open Remote Desktop (mstsc.exe)

  - Enable Local Drives access

  - Enter the public IP and login using adminuser credentials.

- Copy demo.bak from your Terraform root directory to C:\Backup\bank.bak

- Restore the Bank database using SQLCMD or SSMS:

```
RESTORE DATABASE Bank
FROM DISK = 'C:\backup\bank.bak'
WITH
  MOVE 'Bank' TO 'C:\Program Files\Microsoft SQL
Server\MSSQL16.MSSQLSERVER\MSSQL\DATA\Bank.mdf',
  MOVE 'Bank_log' TO 'C:\Program Files\Microsoft SQL
Server\MSSQL16.MSSQLSERVER\MSSQL\DATA\Bank.ldf',
  REPLACE,
  RECOVERY,
  STATS = 10;
```

Step 8: Lab Clean Up

- Remove all deployed resource using **terraform destroy**

Congratulations you have completed this lab