Lab Report

CST8912 – Cloud Solution Architecture

Lab 6

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Submitted to: Prof. Tanishq Bansal

Title

Azure Private Endpoint and Private Link Lab

Introduction / Purpose

The objective of this lab is to configure **Private Endpoint** and **Private Link** in Azure to establish private connectivity within a virtual network while ensuring data traffic is not exposed to the public internet. By completing this lab, we will learn how to:

- **Create an Azure Virtual Network (VNet) and Subnet**
- **Configure Azure Bastion for remote access**
- **Create and configure an Azure Storage Account**
- **Disable public access to the storage account**
- **Create a Private Endpoint for private connectivity**
- **Access Blob storage using Azure Storage Explorer**
- **Test network connectivity and verify Private Endpoint configuration**

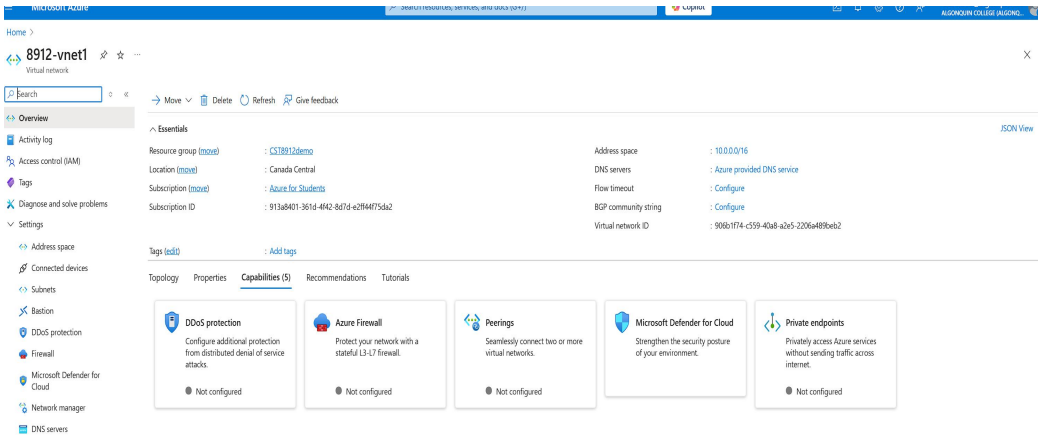
Steps Covered in the Lab

1. Creating a Virtual Network and Bastion

1. In the **Azure portal**, search for **"Virtual networks"** and click **"+ Create"**.
2. In the **Basics** tab, enter the following:
    - **Subscription:** Azure for Students
    - **Resource Group:** CST8912demo
    - **Name:** 8912-vnet1
    - **Region:** Canada Central
3. Navigate to the **IP Addresses** tab:

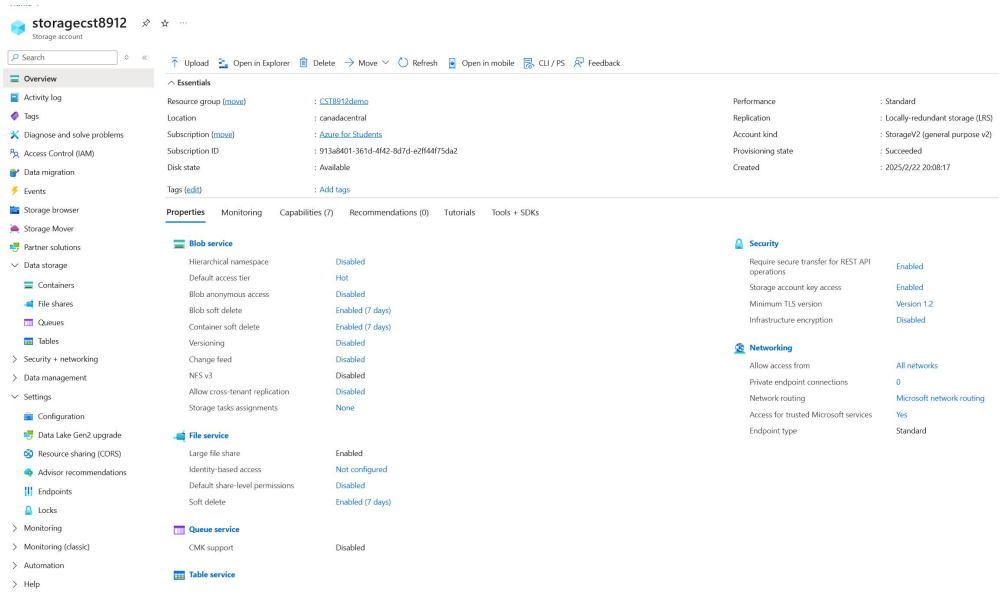
- **Address space:** 10.0.0.0/16
- **Create a subnet:**
    - **Subnet Name:** Subnet-1-8912
    - **Address range:** 10.0.0.0/24

4. In the **Security** tab, enable **Azure Bastion**.
5. Configure Bastion:
    - **Name:** Bastion8912
    - **Public IP:** public-ip
6. Click **Review + Create** and deploy.



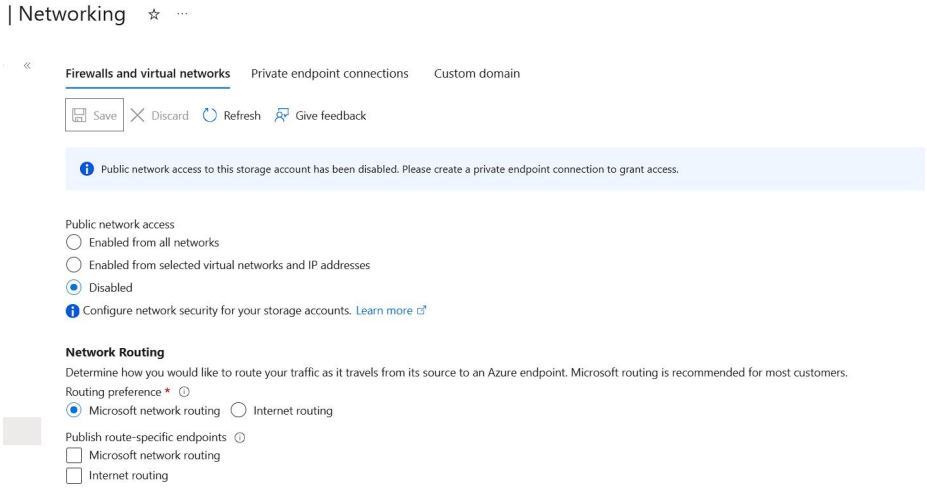
2. Creating an Azure Storage Account

1. In the **Azure portal**, search for **"Storage accounts"** and click **"+ Create"**.
2. In the **Basics** tab, enter:
    - **Subscription:** Azure for Students
    - **Resource Group:** CST8912demo
    - **Storage Account Name:** storagecst8912
    - **Region:** Canada Central
    - **Performance:** Standard
    - **Redundancy:** LRS
3. Click **Review + Create** and deploy.



3. Disabling Public Access to the Storage Account

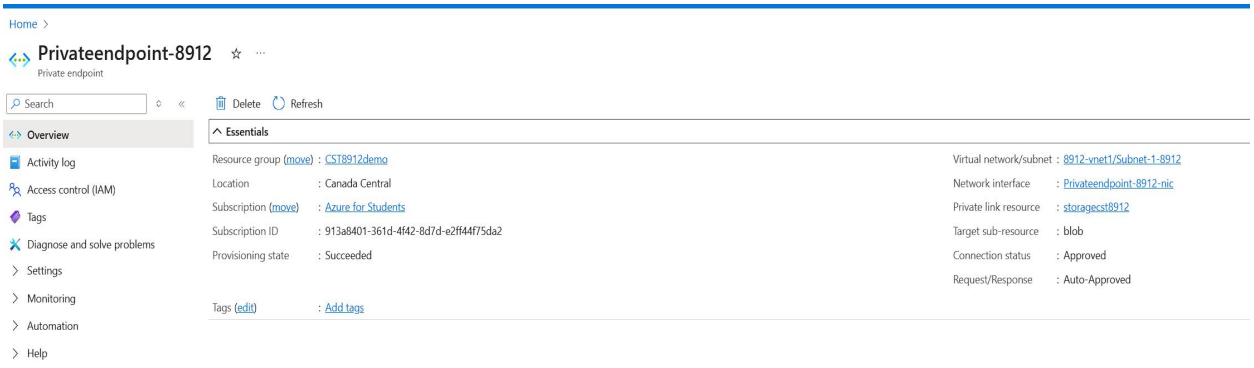
1. Navigate to **Storage accounts** > **storagecst8912**.
2. Click **Security + networking** > **Networking**.
3. In the **Firewalls and virtual networks** tab:
    - **Public Network Access:** Select **Disabled**.
4. Click **Save**.



4. Creating a Private Endpoint

1. In the **Azure portal**, search for **"Private endpoints"** and click **"+ Create"**.

2. In the **Basics** tab, enter:
    - **Subscription:** Azure for Students
    - **Resource Group:** CST8912demo
    - **Name:** Privateendpoint-8912
    - **Region:** Canada Central
3. In the **Resource** tab:
    - **Connection method:** Connect to an Azure resource in my directory
    - **Resource type:** Microsoft.Storage/storageAccounts
    - **Resource:** storagecst8912
    - **Target subresource:** Blob
4. In the **Virtual Network** tab:
    - **Virtual network:** 8912-vnet1
    - **Subnet:** Subnet-1-8912
    - Click **Edit network policy**, ensure **NSG & Route Tables** are applied.
5. Click **Review + Create** and deploy.



5. Creating a Test Virtual Machine

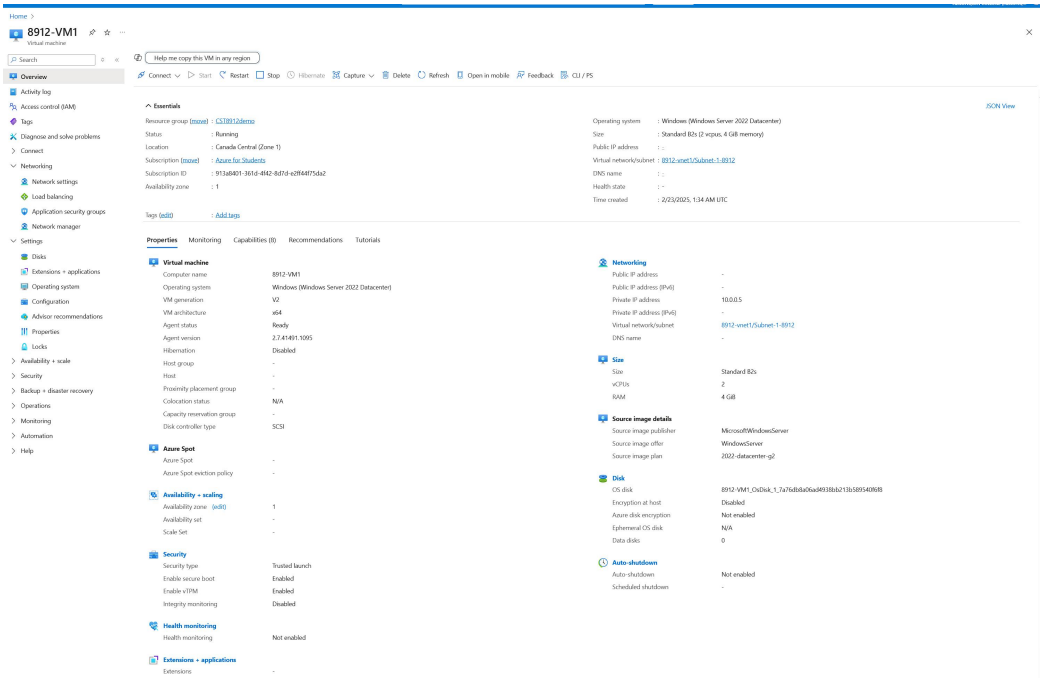
1. In the **Azure portal**, search for **"Virtual machines"** and click **"+ Create"**.
2. In the **Basics** tab, enter:
    - **Subscription:** Azure for Students
    - **Resource Group:** CST8912demo
    - **Name:** 8912-VM1
    - **Image:** Windows Server 2022 Datacenter

- **Size:** B1
- **Authentication:** Username & Password
- **Public inbound ports:** None

3. In the **Networking** tab:

   - **Virtual Network:** 8912-vnet1
   - **Subnet:** Subnet-1-8912
   - **Public IP:** None
   - **NSG:** Create new (nsg-1)

4. Click **Review + Create** and deploy.



6. Connecting to VM and Testing Private Endpoint

(1) Connect to VM via Bastion

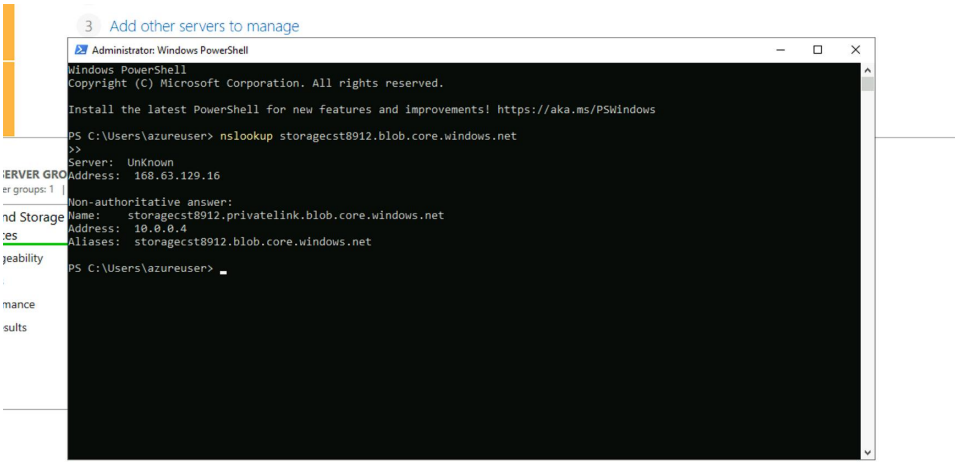
1. Navigate to **Virtual Machines** > **8912-VM1**.
2. In the left panel, click **Connect > Bastion**.
3. Enter the **Username** and **Password**.
4. Click **Connect**.

(2) Run nslookup in VM

1.Open **PowerShell** in the VM.

Run:powershell:nslookup storagecst8912.blob.core.windows.net

9.The result should resolve to **Private Link (privatelink.blob.core.windows.net)** with a private IP (e.g., 10.0.0.4).



(3) Test Connectivity on Port 443

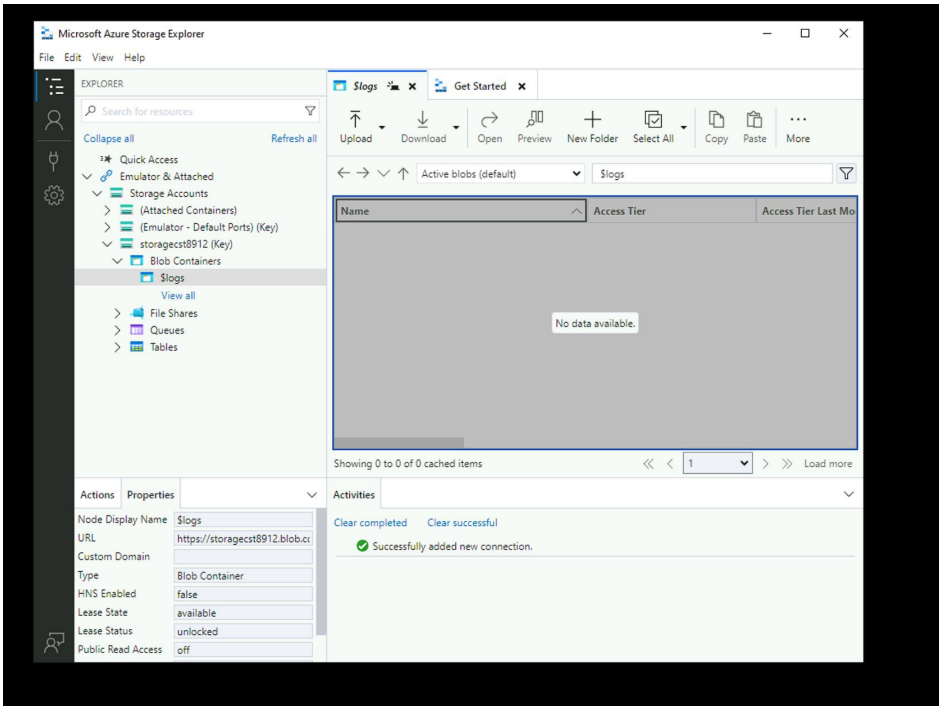
1.Run in PowerShell:

2.powershell:Test-NetConnection storagecst8912.blob.core.windows.net -Port 443

The result should return TcpTestSucceeded: True.

7. Accessing Blob Storage via Storage Explorer

1. In the VM, download **Microsoft Azure Storage Explorer**.
2. Open Storage Explorer.
3. Select **Storage account or service**.
4. Choose **Connection string**.
5. In Azure Portal, navigate to **storagecst8912** > **Access Keys**.
6. Copy the **Connection String** and paste it into Storage Explorer.
7. Click **Connect**.
8. Expand **Blob Containers** to verify access to **container**.



Results

This lab was successfully completed, and the results are as follows:

- **Azure Private Endpoint was successfully configured**.
- **nslookup resolved storagecst8912 to a Private Link**.
- **Test-NetConnection verified connectivity over port 443**.
- **Storage Explorer was able to access Blob storage successfully**.

References

- Microsoft Docs: Azure Private Link
- Azure Storage Explorer: Download & Install
- Azure Networking Best Practices: Microsoft Docs