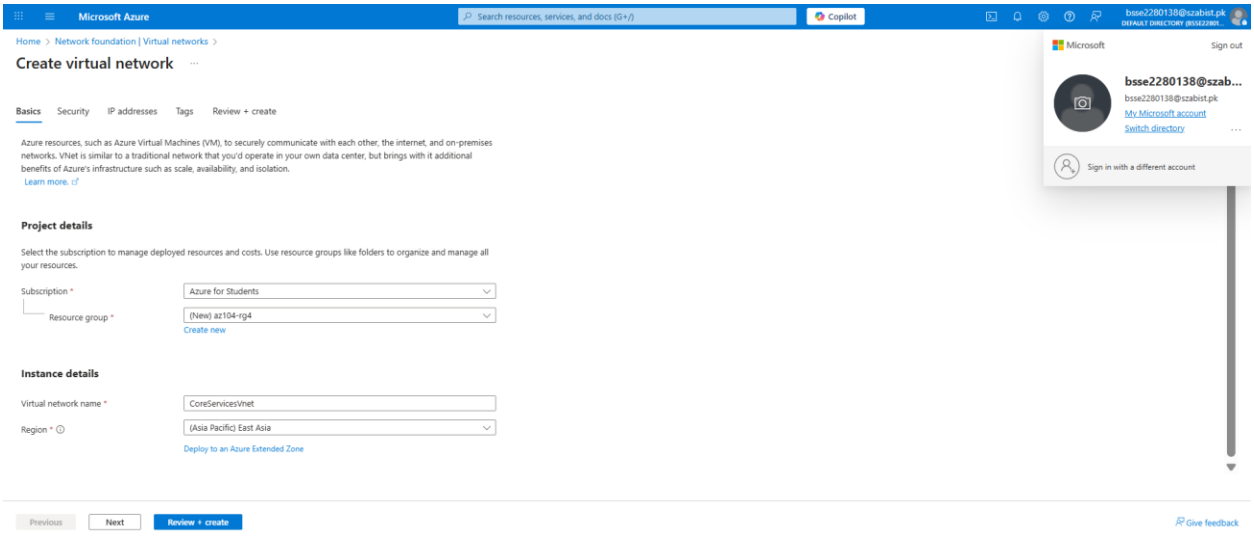
INTRODUCTION TO CLOUD COMPUTING

Lab Task 03 (Implement Virtual Networking)

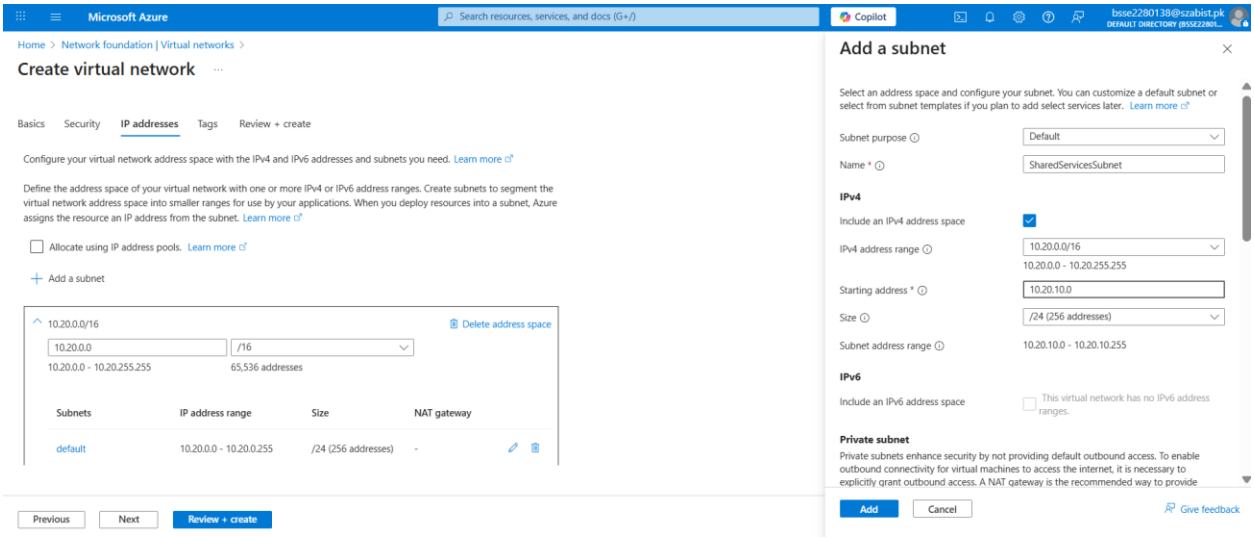
Name: M. Talha Arif

Task 1: Create a virtual network with subnets using the portal.

- **Create a Virtual network "CoreServicesVnet":**



- **Configure IP Address Space & Create SharedServicesSubnet:**



- **Create DatabaseSubnet:**

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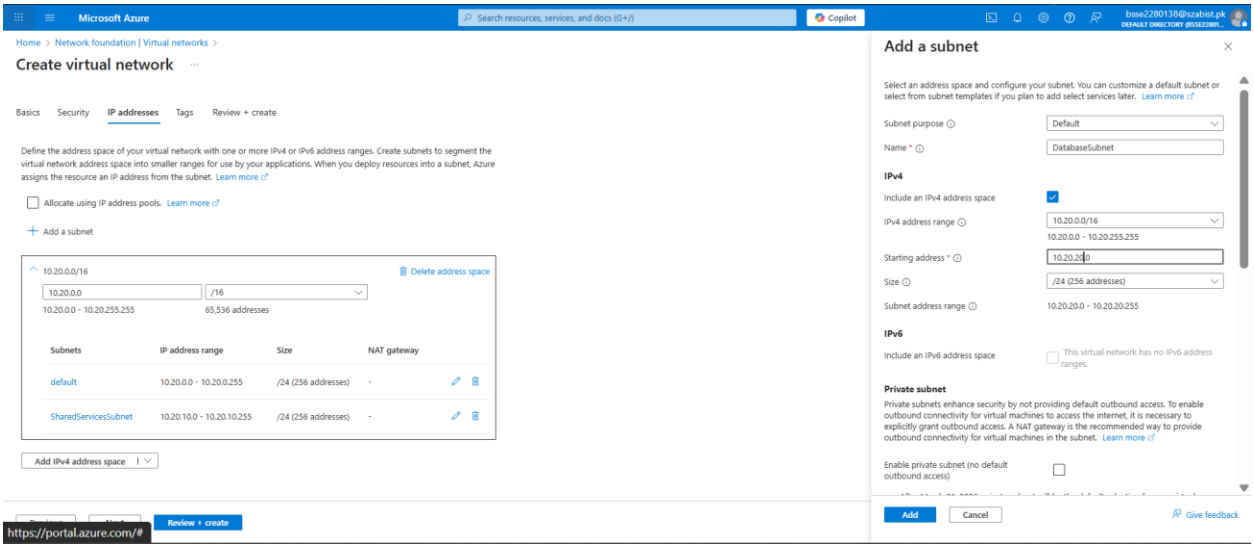
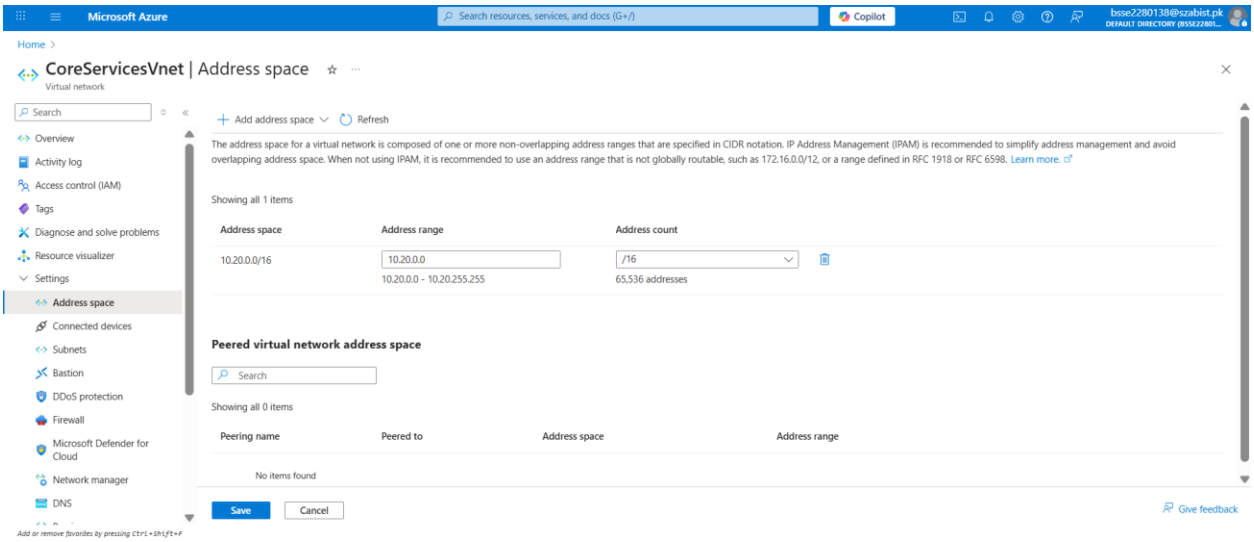
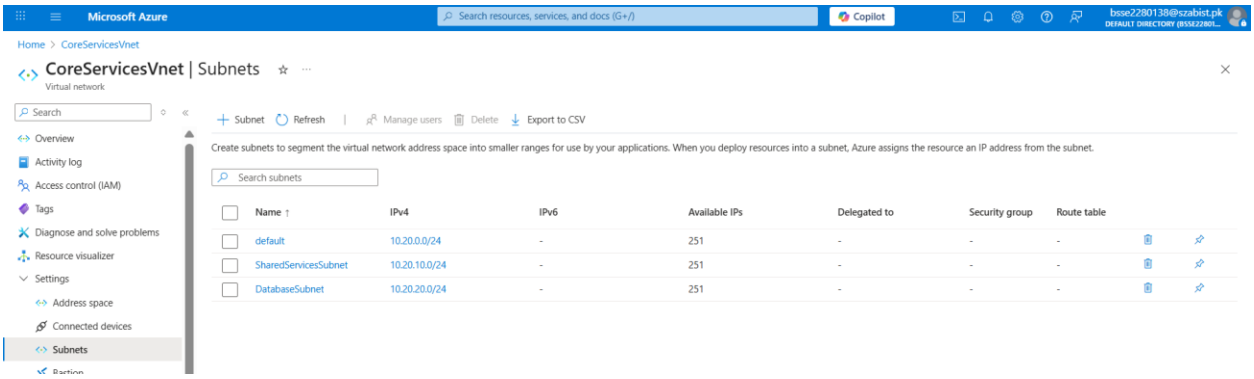


- **Verify Virtual Network and Subnets:**





- **Export ARM Template:**

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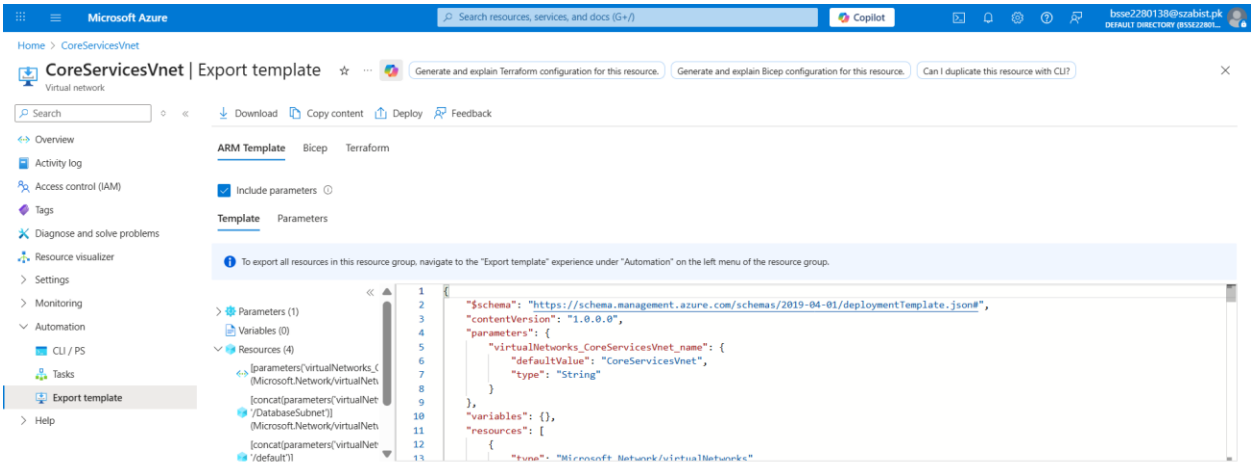

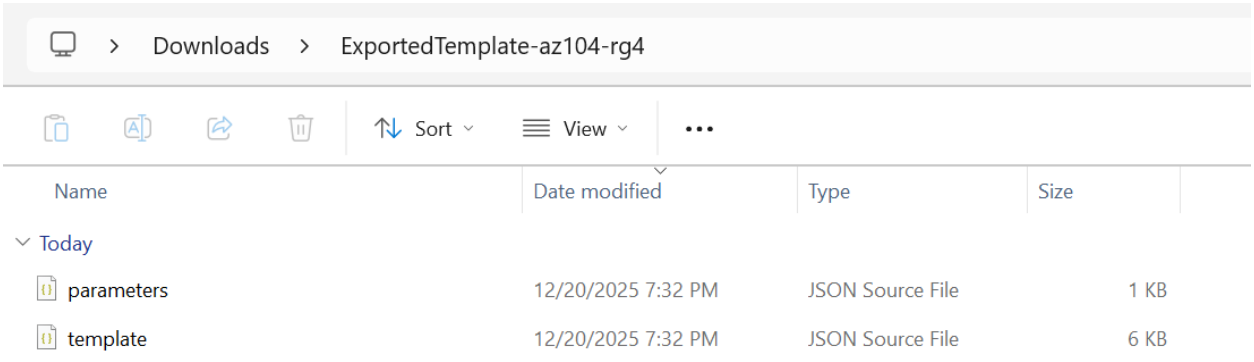

Task 2: Create a virtual network and subnets using a template.

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- **Edit ARM Template for ManufacturingVnet & Modify Address Space and Subnets:**

C: > Users > hp > Downloads > ExportedTemplate-az104-rg4 > {} template.json > [ ] resources > { } 0 > { } properties > [ ] subnets > { } 1 > { } properties >

```
{
    "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {
        "virtualNetworks_ManufacturingVnet_name": {
            "defaultValue": "ManufacturingVnet",
            "type": "String"
        }
    },
    "variables": {},
    "resources": [
        {
            "type": "Microsoft.Network/virtualNetworks",
            "apiVersion": "2024-07-01",
            "name": "[parameters('virtualNetworks_ManufacturingVnet_name')]",
            "location": "eastasia",
            "properties": {
                "addressSpace": {
                    "addressPrefixes": [
                        "10.30.0.0/16"
                    ]
                },
                "encryption": {
                    "enabled": false,
                    "enforcement": "AllowUnencrypted"
                },
                "privateEndpointVNetPolicies": "Disabled",
                "subnets": [
                    {
```

C: > Users > hp > Downloads > ExportedTemplate-az104-rg4 > {} template.json > [ ] resources > { } 0 > { } properties > [ ] subnets > { } 1 > { } properties > abc privateLinkServiceNetworkPolici

```
s": {
ts": [
    "name": "default",
    "id": "[resourceId('Microsoft.Network/virtualNetworks/subnets', parameters('virtualNetworks_ManufacturingVnet_name'), 'default')]",
    "properties": {
        "addressPrefixes": [
            "10.30.0.0/24"
        ],
        "delegations": [],
        "privateEndpointNetworkPolicies": "Disabled",
        "privateLinkServiceNetworkPolicies": "Enabled"
    },
    "type": "Microsoft.Network/virtualNetworks/subnets"

    "name": "SensorSubnet1",
    "id": "[resourceId('Microsoft.Network/virtualNetworks/subnets', parameters('virtualNetworks_ManufacturingVnet_name'), 'SensorSubnet1')]",
    "properties": {
        "addressPrefixes": [
            "10.30.20.0/24"
        ],
        "delegations": [],
        "privateEndpointNetworkPolicies": "Disabled",
        "privateLinkServiceNetworkPolicies": "Enabled"
    },
    "type": "Microsoft.Network/virtualNetworks/subnets"
```

```
"name": "SensorSubnet2",
"id": "[resourceId('Microsoft.Network/virtualNetworks/subnets', parameters('virtualNetworks_ManufacturingVnet_name'), 'SensorSubnet2')]",
"properties": {
    "addressPrefixes": [
        "10.30.21.0/24"
    ],
    "delegations": [],
    "privateEndpointNetworkPolicies": "Disabled",
    "privateLinkServiceNetworkPolicies": "Enabled"
},
"type": "Microsoft.Network/virtualNetworks/subnets"
```

```
        {
            "type": "Microsoft.Network/virtualNetworks/subnets",
            "apiVersion": "2024-07-01",
            "name": "[concat(parameters('virtualNetworks_ManufacturingVnet_name'), '/SensorSubnet2')]",
            "dependsOn": [
                "[resourceId('Microsoft.Network/virtualNetworks', parameters('virtualNetworks_ManufacturingVnet_name'))]"
            ],
            "properties": {
                "addressPrefixes": [
                    "10.30.21.0/24"
                ],
                "delegations": [],
                "privateEndpointNetworkPolicies": "Disabled",
                "privateLinkServiceNetworkPolicies": "Enabled"
            }
        },
        {
            "type": "Microsoft.Network/virtualNetworks/subnets",
            "apiVersion": "2024-07-01",
            "name": "[concat(parameters('virtualNetworks_ManufacturingVnet_name'), '/default')]",
            "dependsOn": [
                "[resourceId('Microsoft.Network/virtualNetworks', parameters('virtualNetworks_ManufacturingVnet_name'))]"
            ],
            "properties": {
                "addressPrefixes": [
                    "10.30.0.0/24"
                ],
                "delegations": [],
                "privateEndpointNetworkPolicies": "Disabled",
                "privateLinkServiceNetworkPolicies": "Enabled"
            }
        },
        {
            "type": "Microsoft.Network/virtualNetworks/subnets",
            "apiVersion": "2024-07-01",
            "name": "[concat(parameters('virtualNetworks_ManufacturingVnet_name'), '/SensorSubnet1')]",
            "dependsOn": [
                "[resourceId('Microsoft.Network/virtualNetworks', parameters('virtualNetworks_ManufacturingVnet_name'))]"
            ],
            "properties": {
                "addressPrefixes": [
                    "10.30.20.0/24"
                ],
                "delegations": [],
                "privateEndpointNetworkPolicies": "Disabled",
                "privateLinkServiceNetworkPolicies": "Enabled"
            }
        }
    ]
}
```

- **Update Parameters File:**

LAB_04-Implement_Virtual_Networking.md | parameters.json ● | template.json 1

C: > Users > hp > Downloads > ExportedTemplate-az104-rg4 > {} parameters.json > ...

```
{
    "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentParameters.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {
        "virtualNetworks_ManufacturingVnet_name": {
            "value": null
        }
    }
}
```

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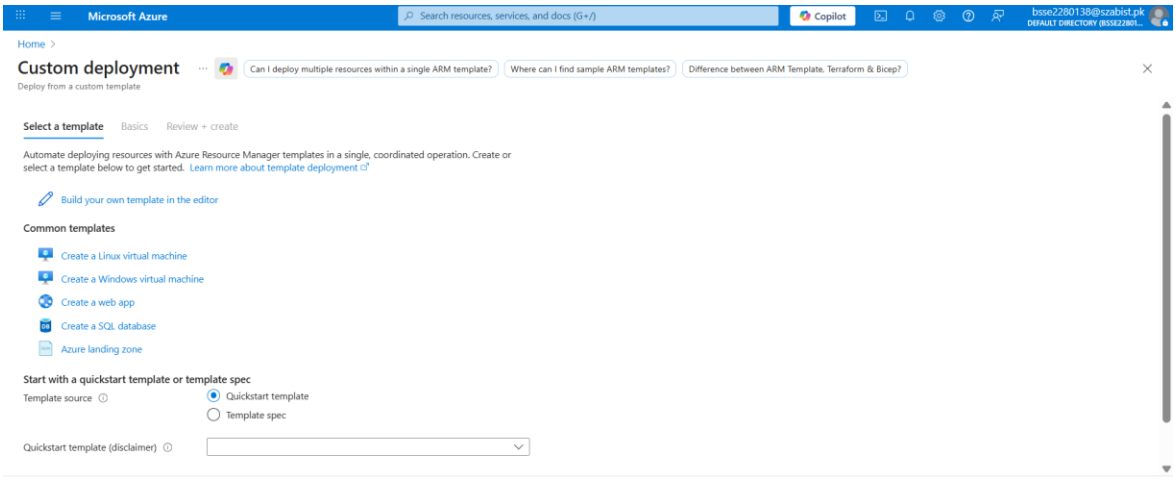
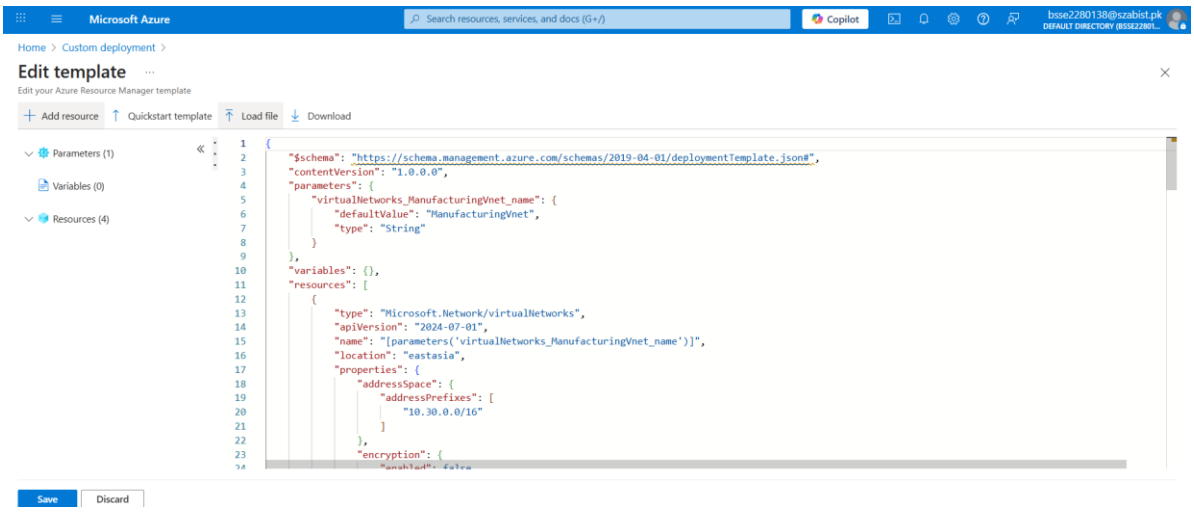
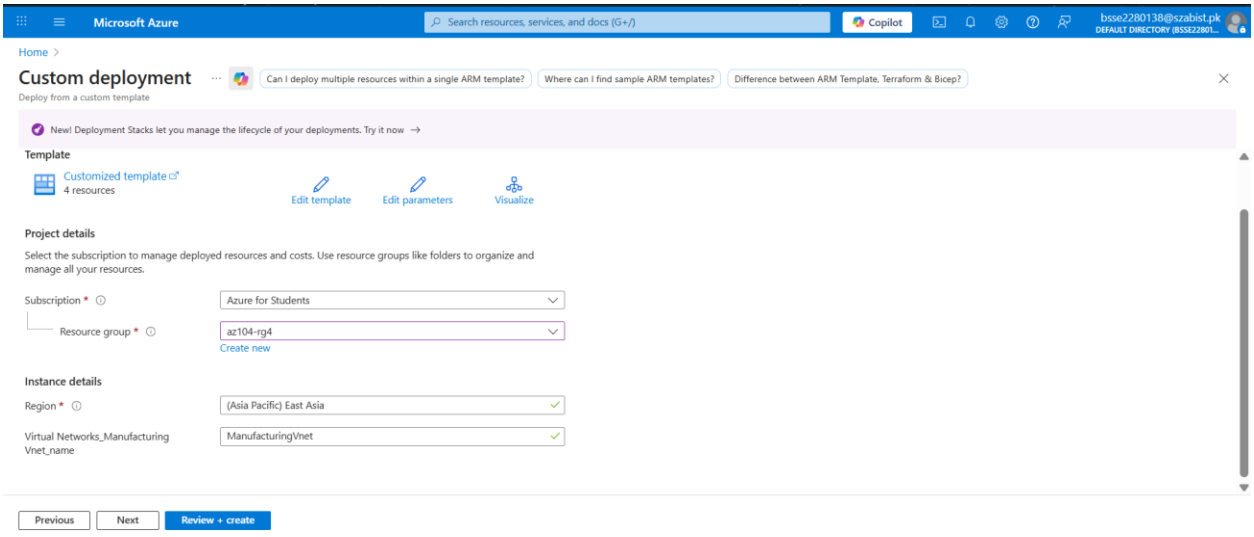
Lab Task 03 (Implement Virtual Networking)

- **Deploy Custom ARM Template:**







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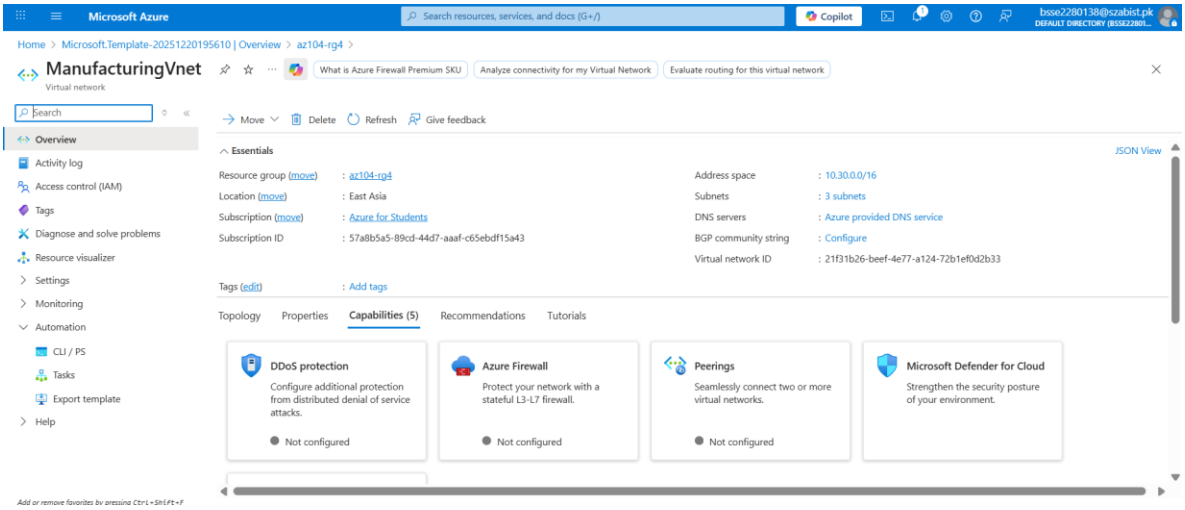
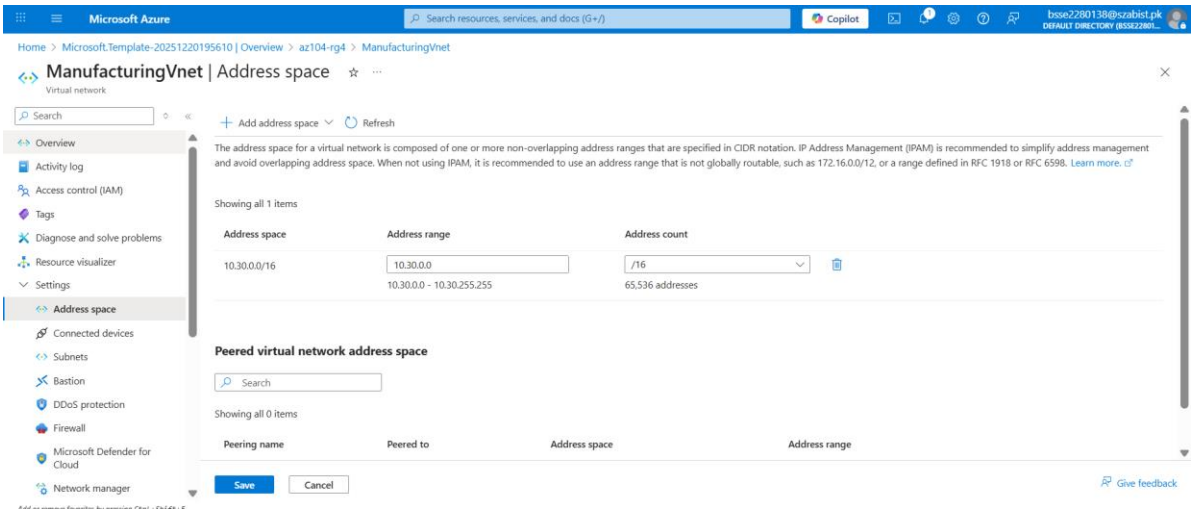
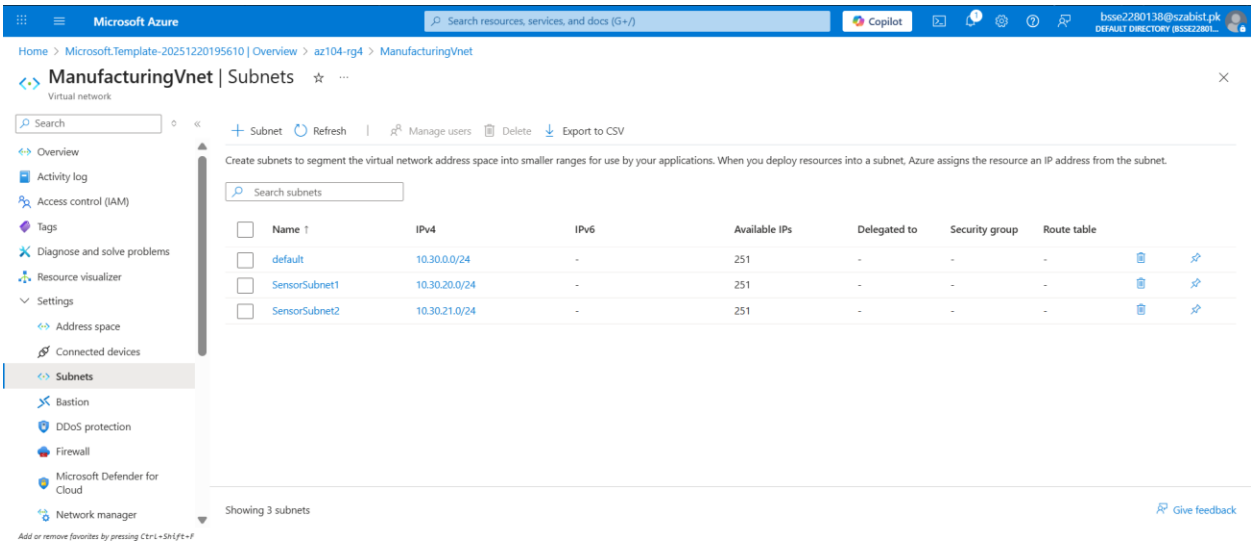
Lab Task 03 (Implement Virtual Networking)

- **Verify ManufacturingVnet and Subnets:**

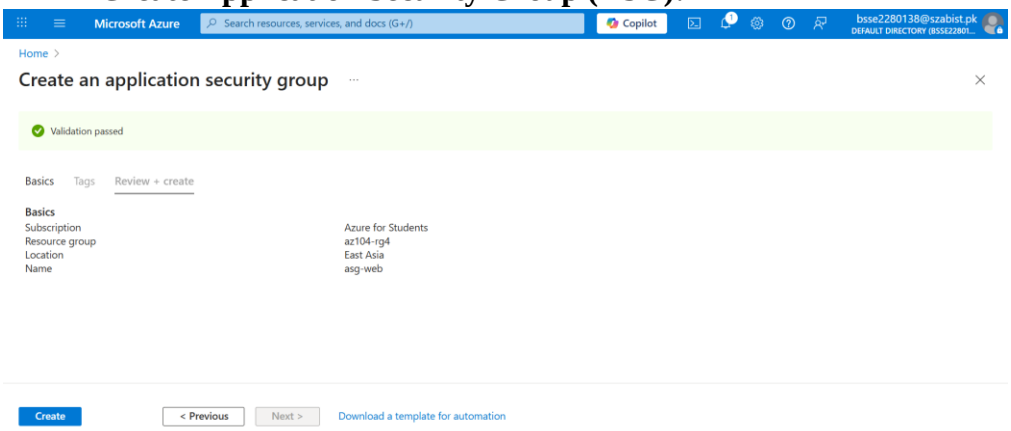


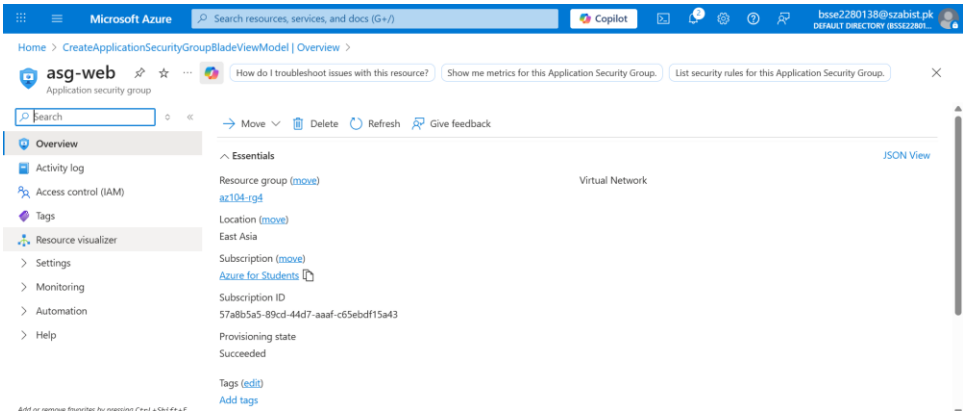




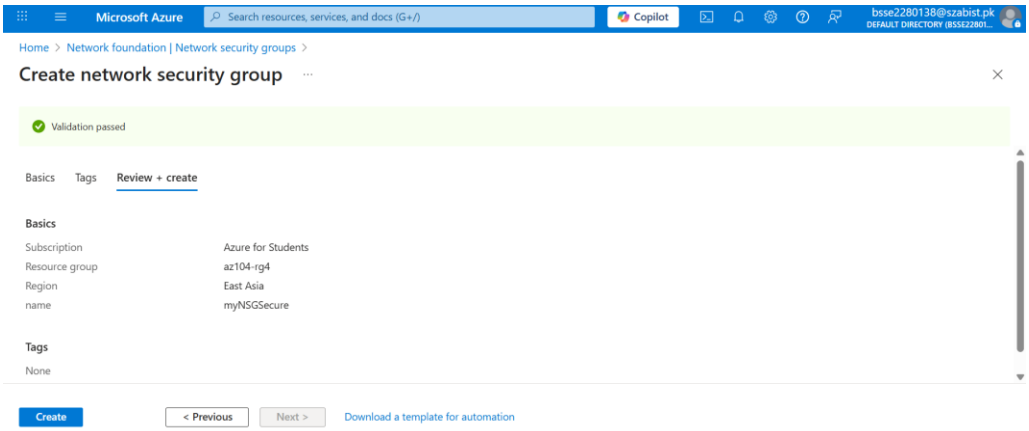
Task 3: Create and configure communication between an Application Security Group and a Network Security Group.

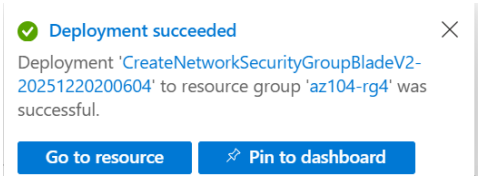
- **Create Application Security Group (ASG):**





- **Create Network Security Group (NSG):**





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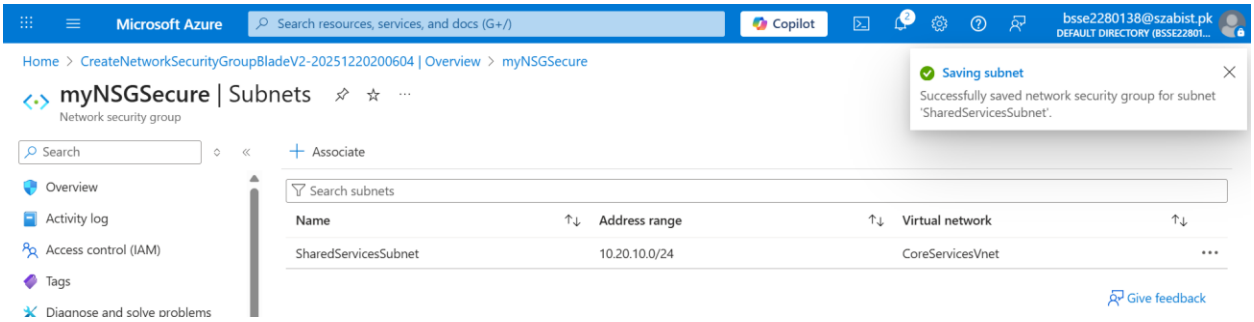
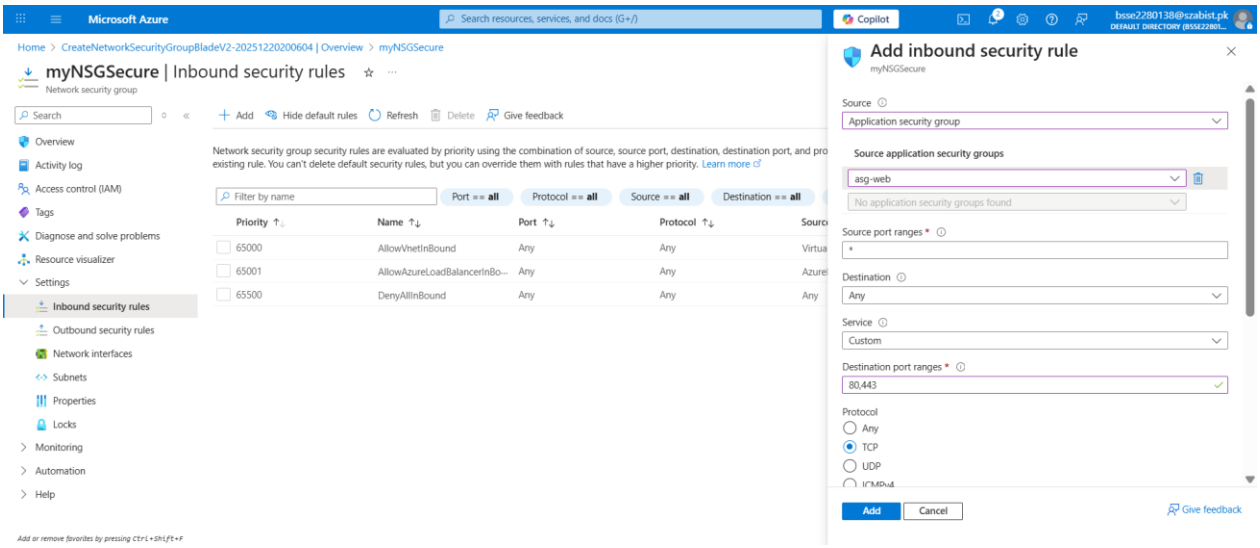
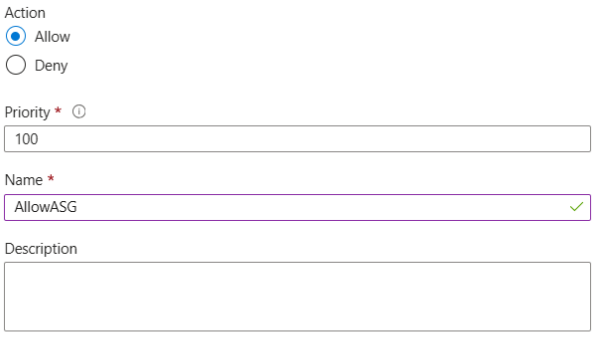
Lab Task 03 (Implement Virtual Networking)

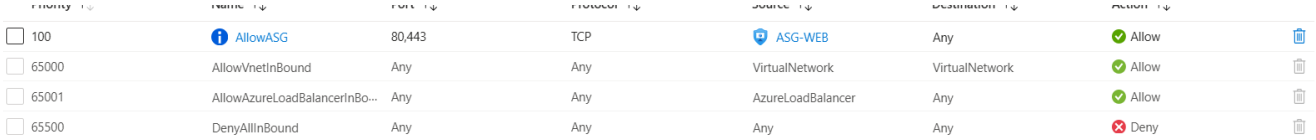
- **Associate NSG with Subnet:**



- **Configure Inbound Rule to Allow ASG Traffic:**







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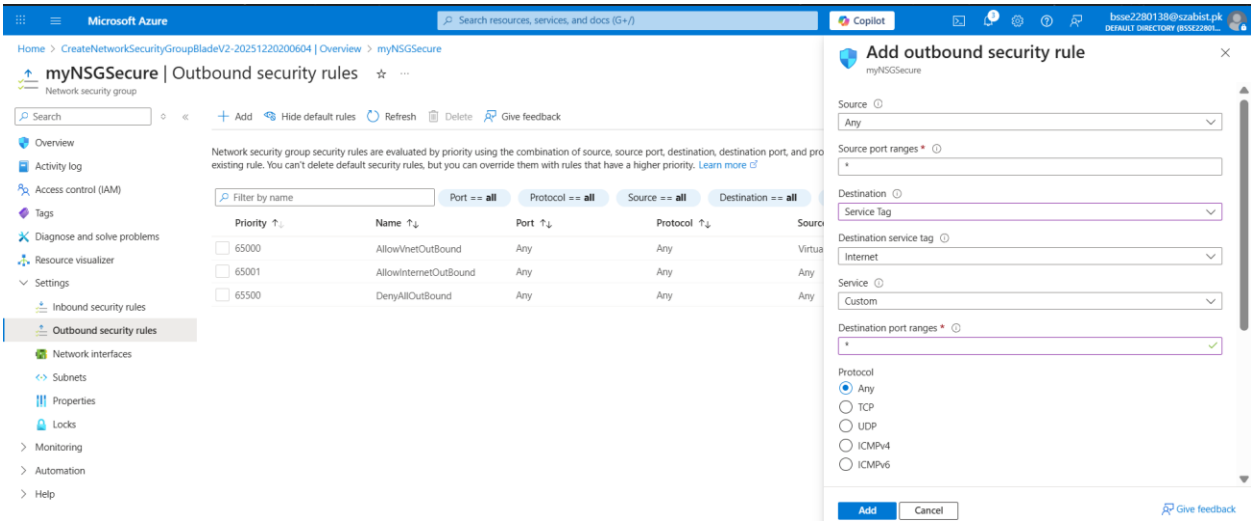
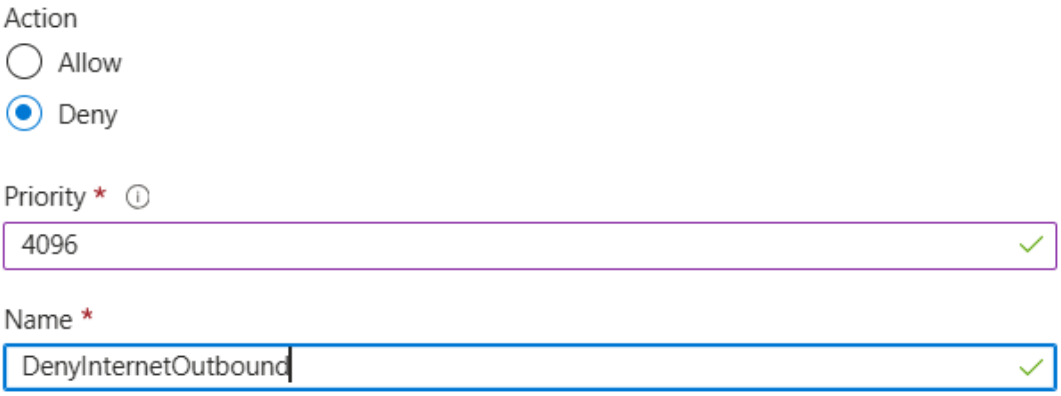
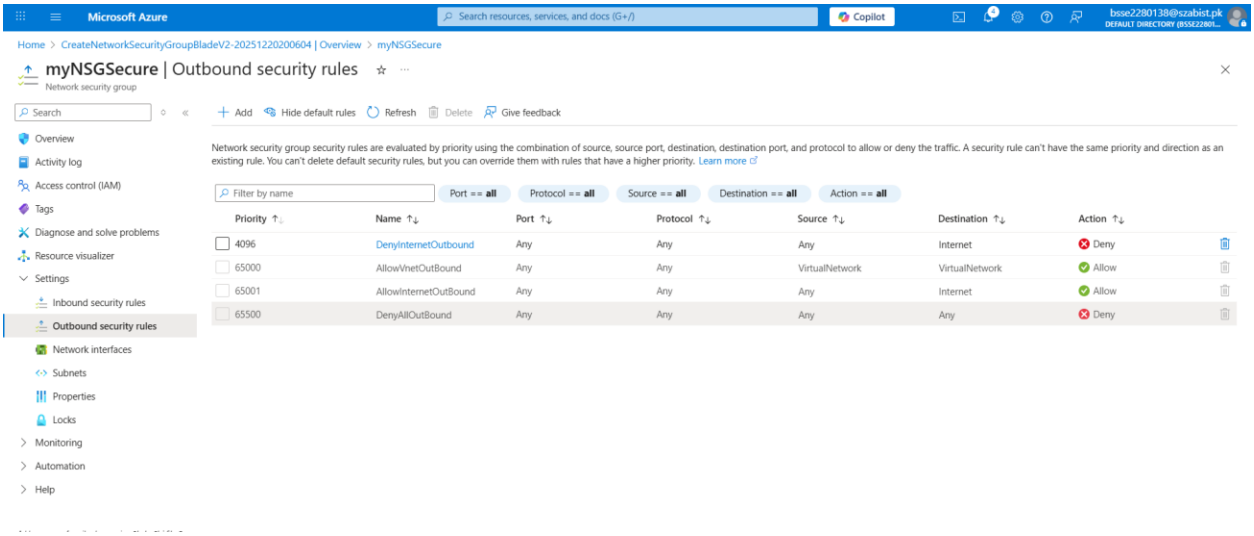
Lab Task 03 (Implement Virtual Networking)

- **Configure Outbound Rule to Deny Internet Access:**



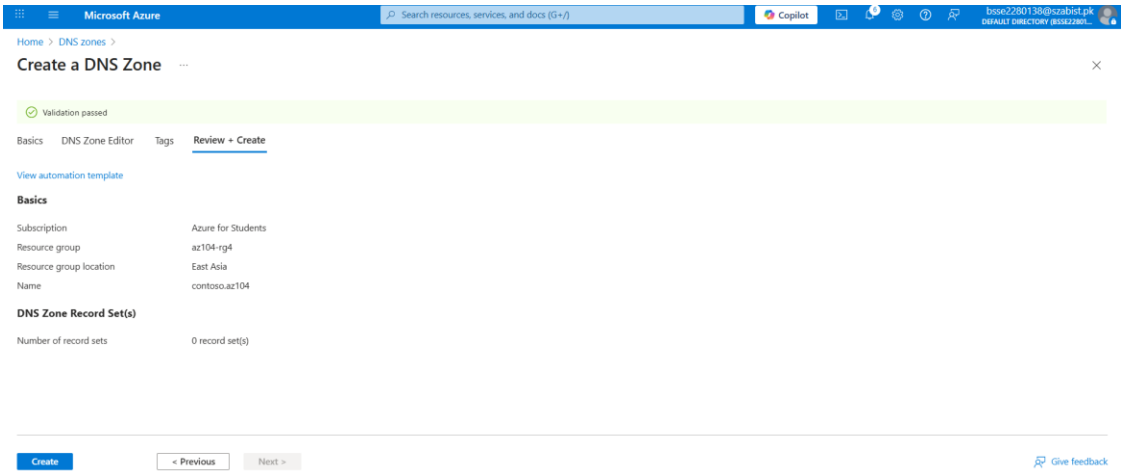




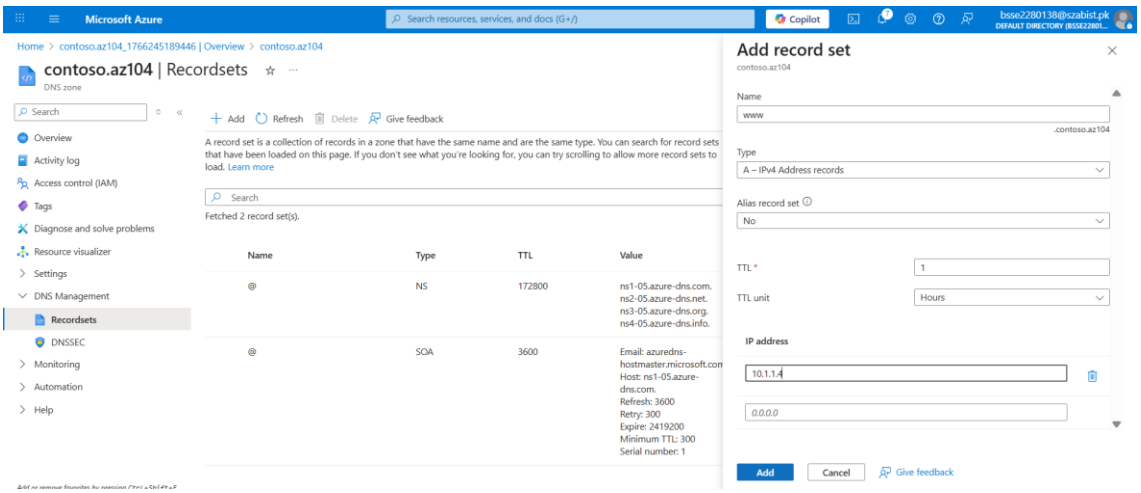
Task 4: Configure public and private Azure DNS zones.

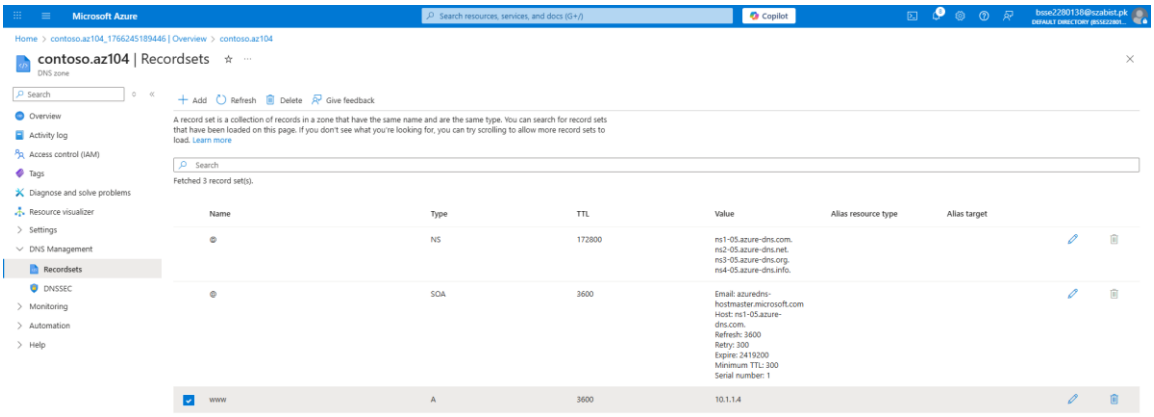
Public DNS Zone

- **Create Public DNS Zone:**



- **Add A Record (www):**





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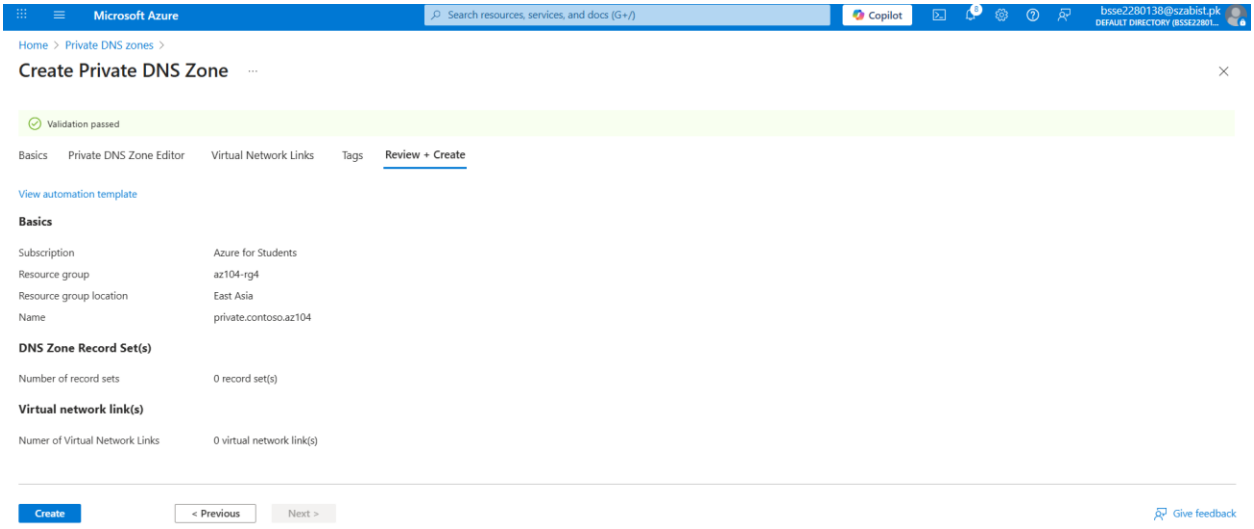
Lab Task 03 (Implement Virtual Networking)

- **Verify DNS Resolution Using nslookup:**

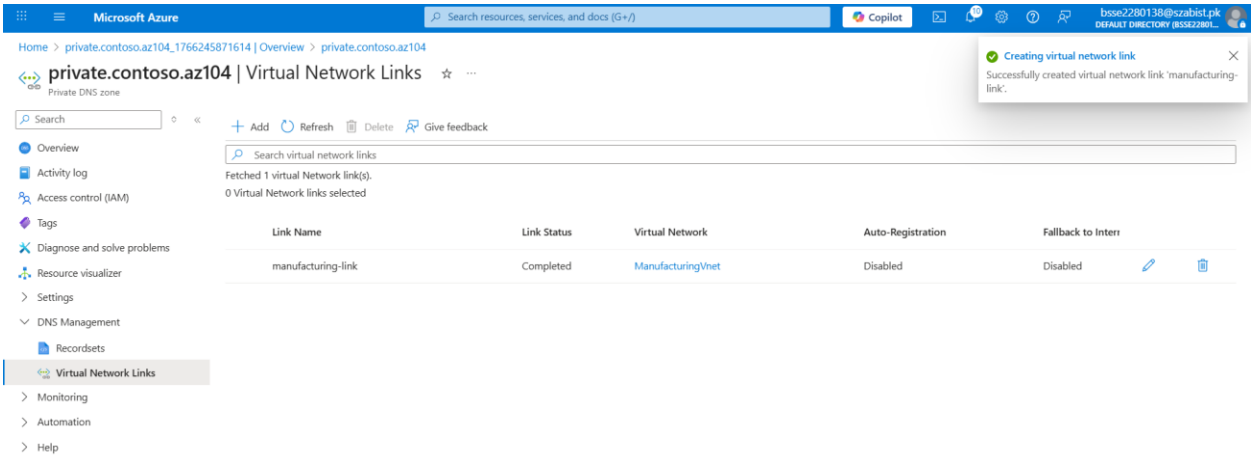
```
PS /home/ariha> nslookup www.contoso.az104 ns1-05.azure-dns.com
Server:         ns1-05.azure-dns.com
Address:        13.107.236.5#53

Name:   www.contoso.az104
Address: 10.1.1.4
```

Private DNS Zone

- **Create Private DNS Zone:**



- **Link Private DNS Zone to Virtual Network:**



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Lab Task 03 (Implement Virtual Networking)

- **Add Private DNS A Record:**