Assignment: Deploying Cloud Services

Course: IN609: Operating System Concepts

Semester 2, 2021 Otago Polytechnic

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This assignment is worth 15%, which includes performing the actual assignment including the planning tasks as part of the instructions!

Deadline: Friday, 17 Sep 2021, 11:59pm

Learning Outcomes

- Investigate cloud and Directory Services
- Execute System Administration Tasks in Diverse Platform

Instructions

In this assignment you will be deploying key infrastructure services for a company named 'ABC International' for their newly purchased Azure subscription. You have started your new position as a cloud solution engineer and your task is to help ABC International to slowly migrate to Azure. Your manager assigned you a simple task of creating a skeleton network infrastructure (as shown in Figure 1) which will be expanded gradually to replicate the existing on-premises set up.

The tasks you need to complete are specified in the tasks section below. Your instructors have already created a dedicated resource group for you on Azure. You will find this resource group as IN609OE1-<yourname> which is the other IN609OE resource group beside the IN609OE1 on your Azure portal under the OP Azure subscription. You might have to delete existing resources from this resource group, if you have any. You will need to use only this resource group for this assignment.

You will need to submit screenshots along with command executions of your deployments as a proof of completion of the tasks.

For any queries, you are welcome to consult your instructors. Please note that we may ask questions related to your submissions after you submit just to make sure that you have understood what you have done. Failing to explain what you have done may result in rejection of the submission.

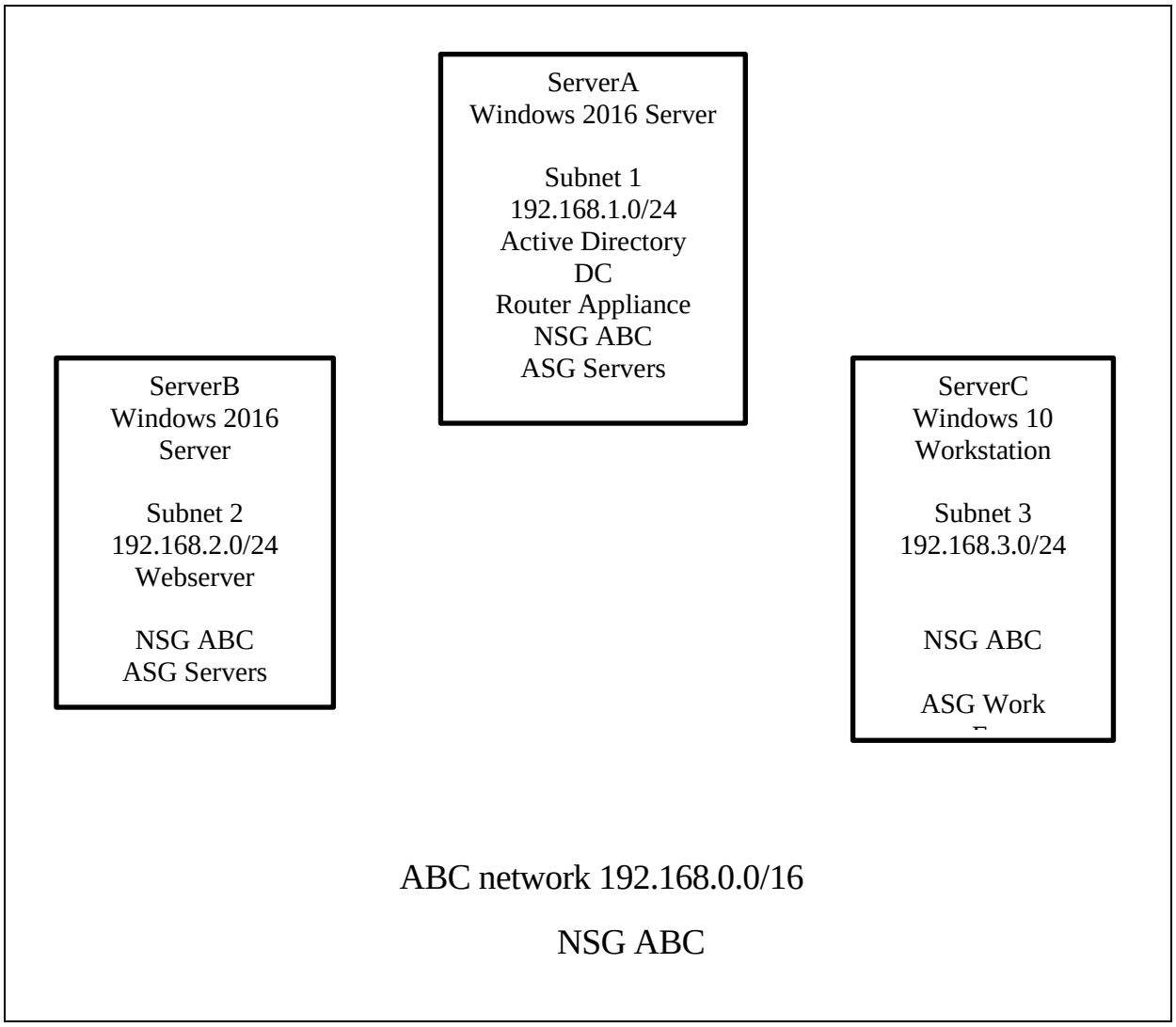


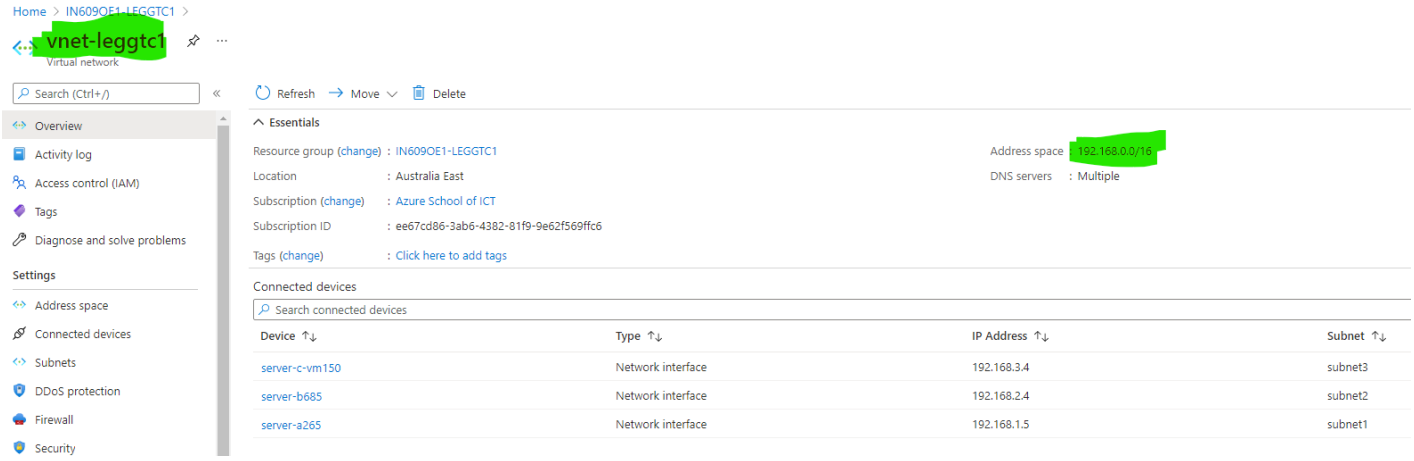
Figure 1: Network Topology

Your tasks will be to do the following:

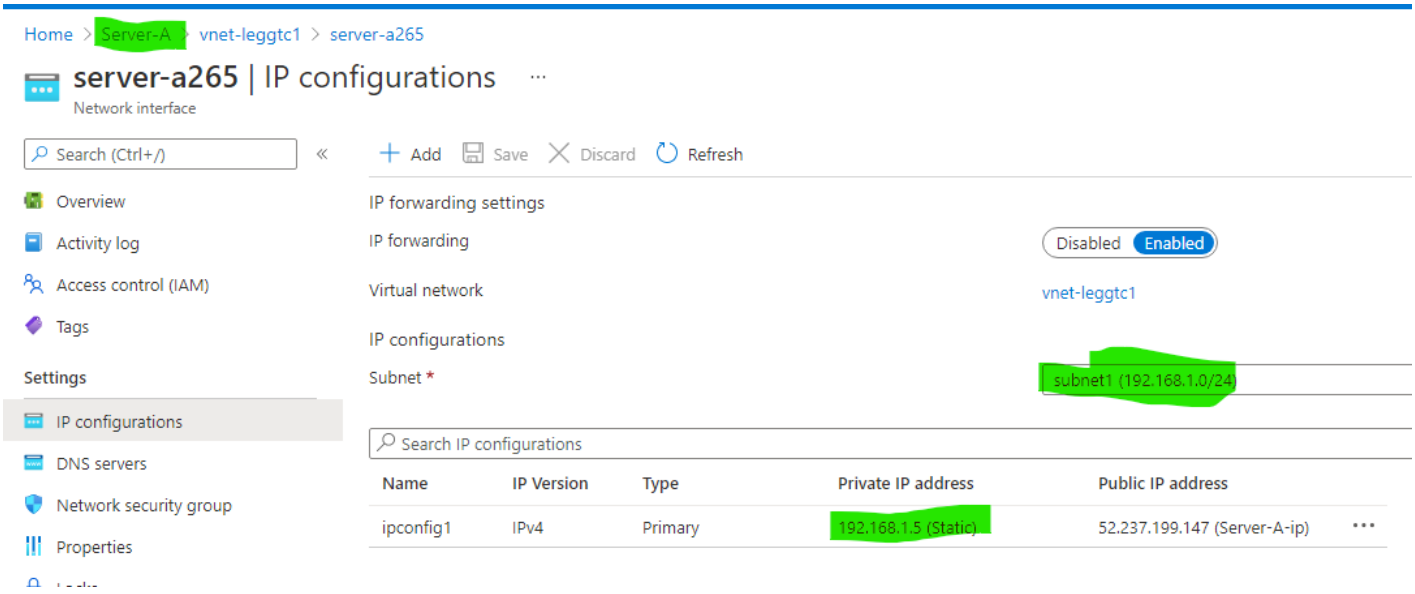
Task 1: create network topology (2 points)

a. A virtual network for ABC International vnet<yournetid> with IP Address 192.168.0.0/16

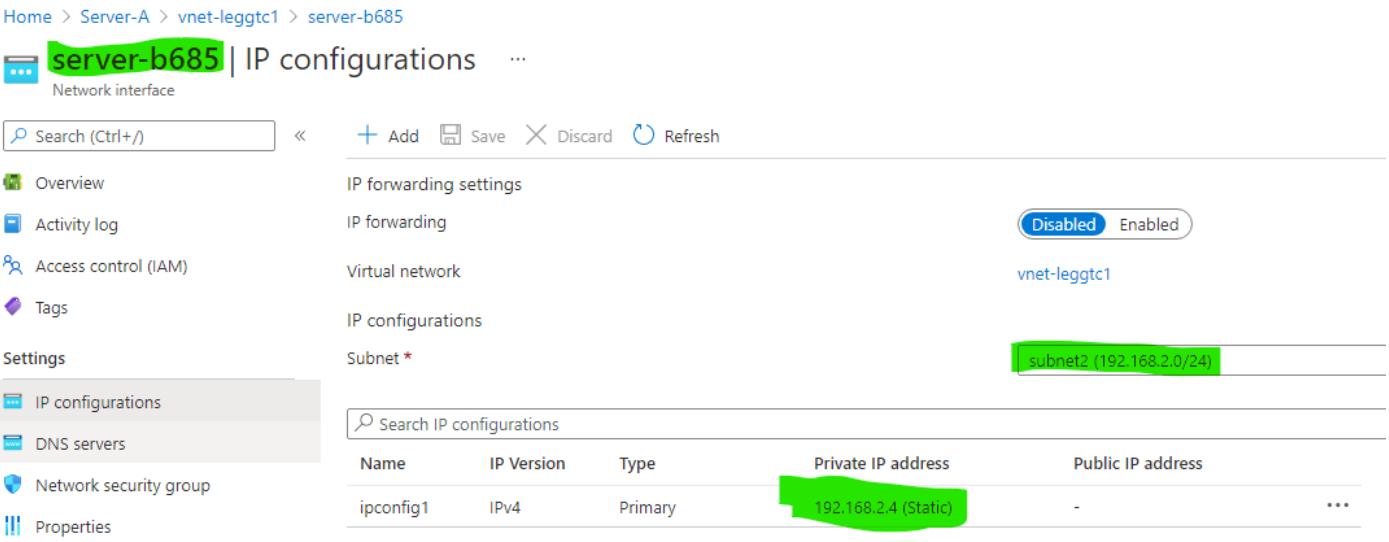
```
# ------------------------- CREATE VIRTUAL NETWORK ------------------------- #

$vnet = @{
    Name = 'vnet-leggtc1'
    ResourceGroupName = 'IN609OE1-LEGGTC1'
    Location = 'AustraliaEast'
    AddressPrefix = '192.168.0.0/16'
}
$virtualNetwork = New-AzVirtualNetwork @vnet
$virtualNetwork | Set-AzVirtualNetwork

$Net = $virtualNetwork.Name
$Loc = $virtualNetwork.Location
$RGroup = $virtualNetwork.ResourceGroupName
```



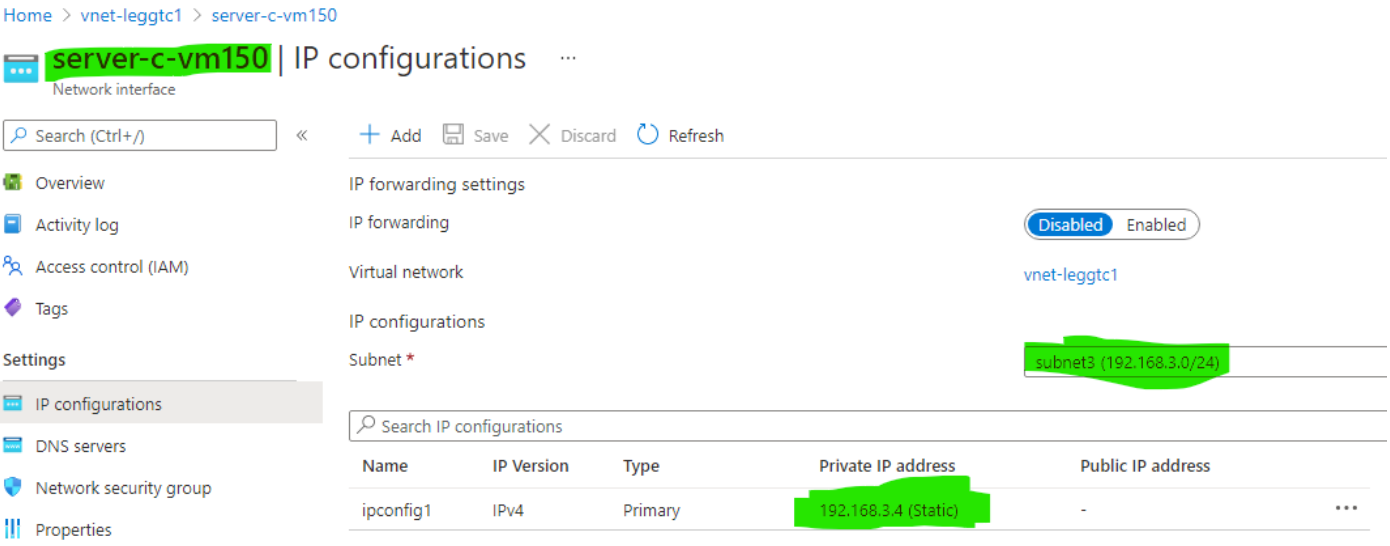
b. Subnet subnet1 192.168.1.0/24



c. Subnet subnet2 192.168.2.0/24



d. Subnet subnet3 192.168.3.0/24

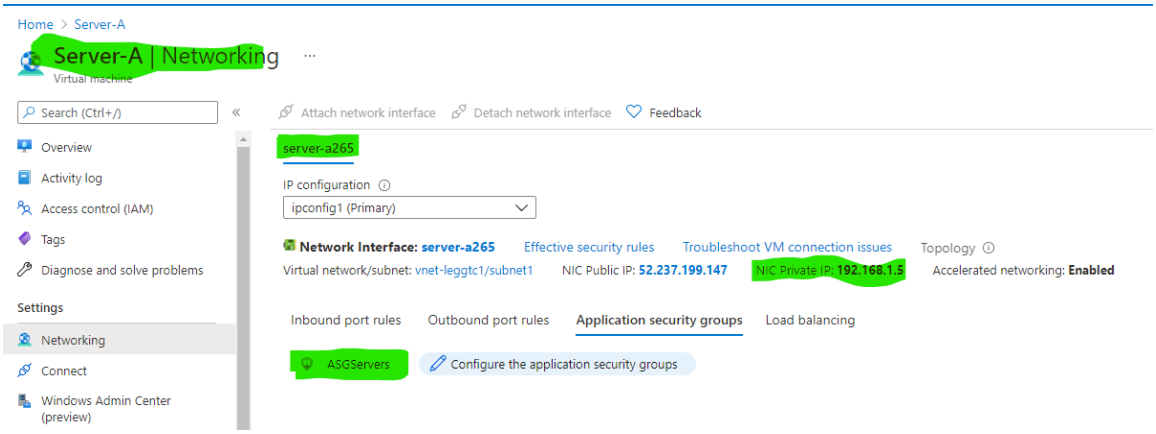


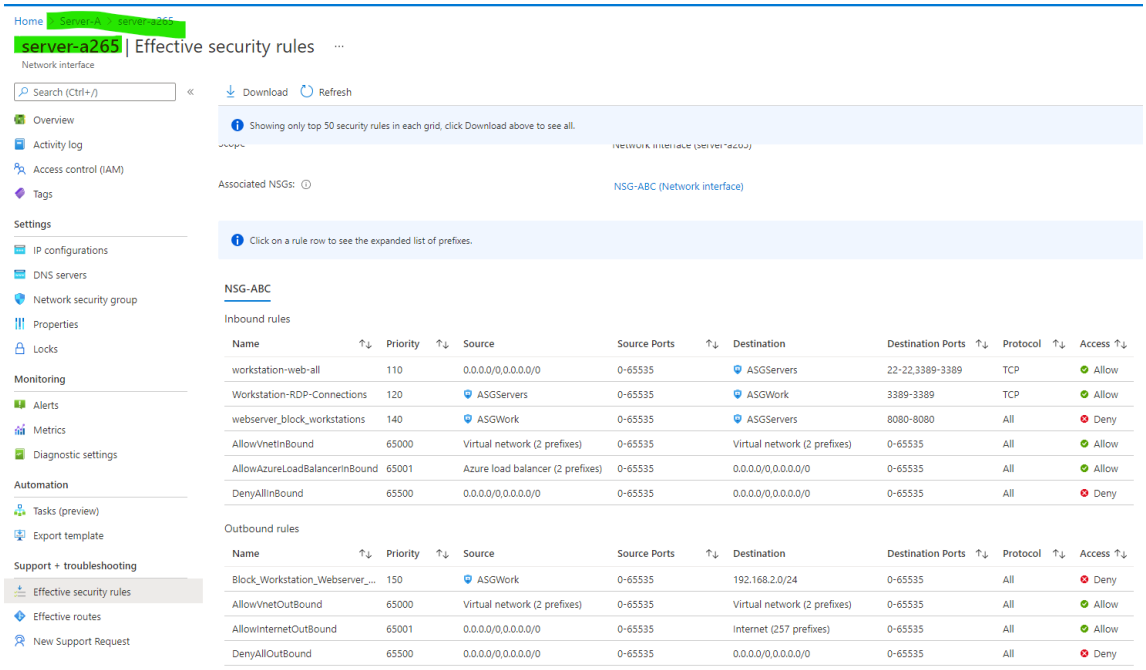
Submission: command execution/screen shot of created subnets

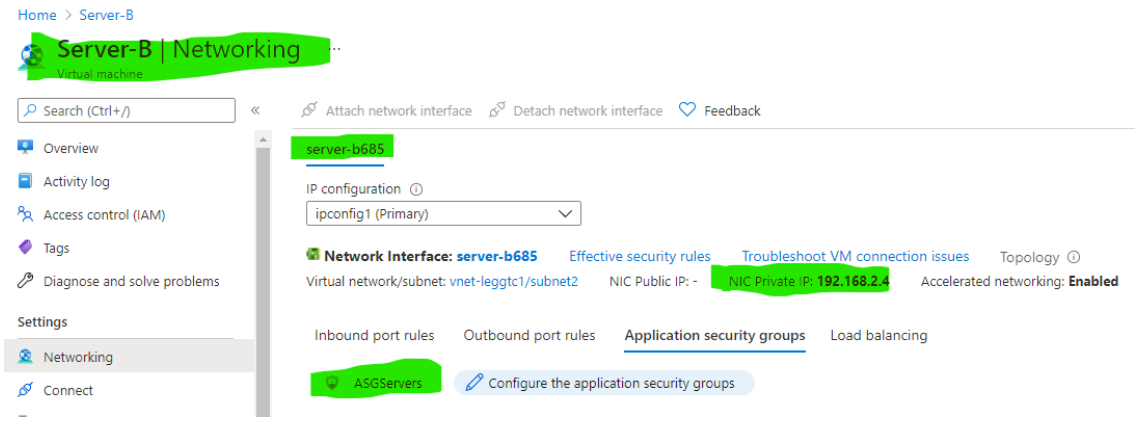
```powershell

# --------- CREATE A SUBNET THAT HAS THE VIRTUAL NETWORK AS A PARENT --------- #
# ------------------ AND USES THE NEW NETWORK SECURITY GROUP ----------------- #

$subnet1 = @{
    Name = 'subnet1'
    VirtualNetwork = $virtualNetwork
    AddressPrefix = '192.168.1.0/24'
    NetworkSecurityGroup = $NSGABC
}

$subnet2 = @{
    Name  = 'subnet2'
    VirtualNetwork = $virtualNetwork
    AddressPrefix = '192.168.2.0/24'
}

$subnet3 = @{
    Name = 'subnet3'
    VirtualNetwork = $virtualNetwork
    AddressPrefix = '192.168.3.0/24'
}

# --------------- ADD NEW SUBNET CONFIG TO THE VIRTUAL NETWORK --------------- #

Add-AzVirtualNetworkSubnetConfig @subnet1
Add-AzVirtualNetworkSubnetConfig @subnet2
Add-AzVirtualNetworkSubnetConfig @subnet3

$virtualNetwork | Set-AzVirtualNetwork

$virtualNetwork = Get-AzVirtualNetwork `
    -Name 'vnet-leggtc1' `
    -ResourceGroupName 'IN6O9OE1-LEGGTC1'

```

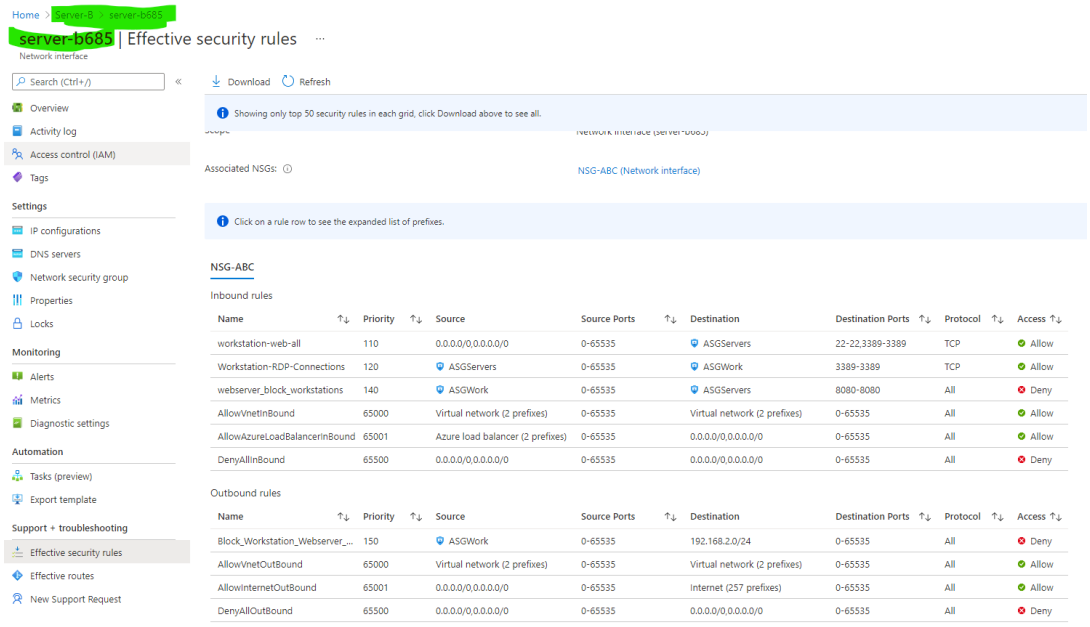
Task 2: Create Application Security Groups (ASG) (3 points)

a. Application security Group ‘AsgServers’ should have Server A and B.

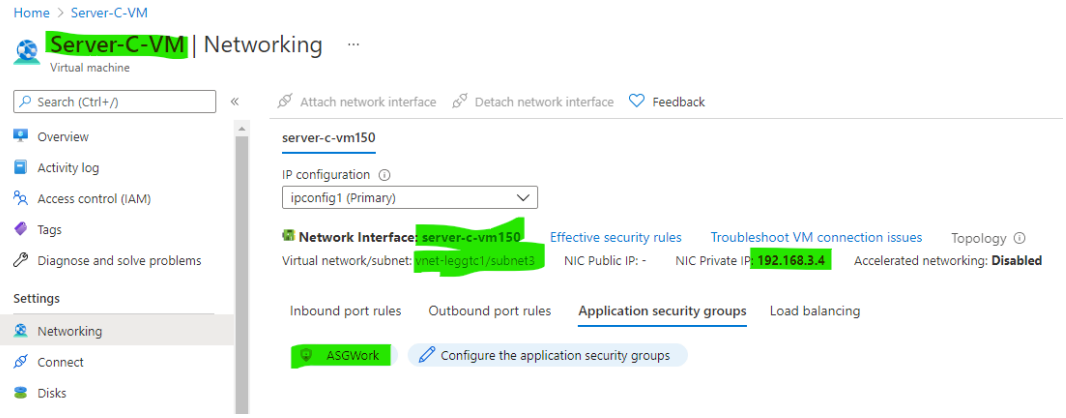


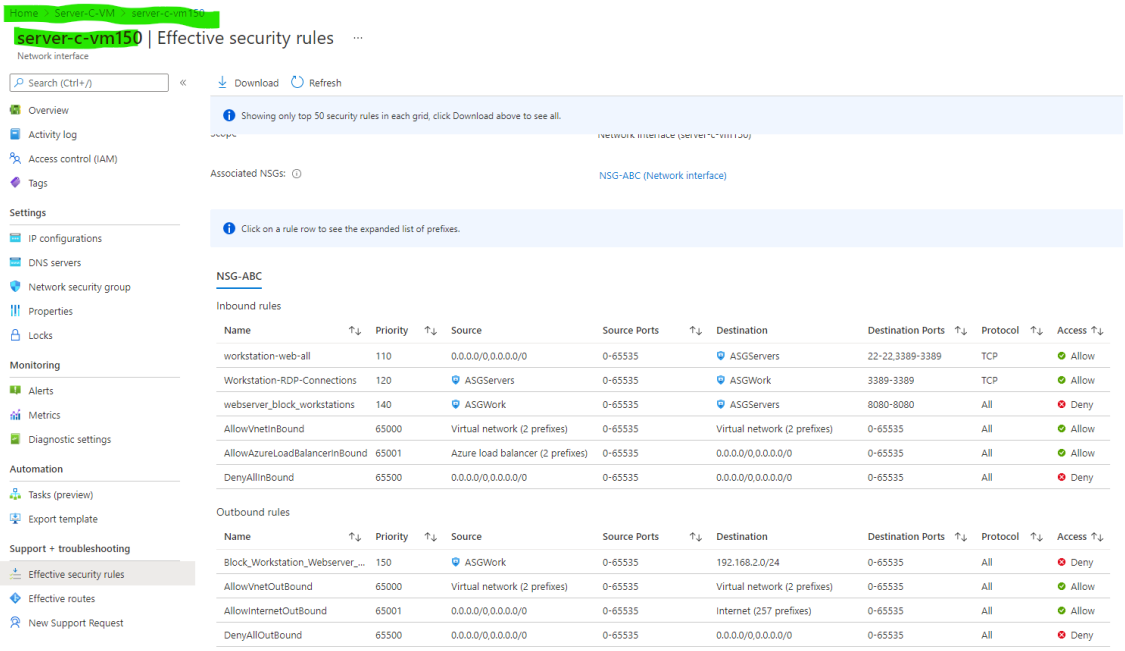




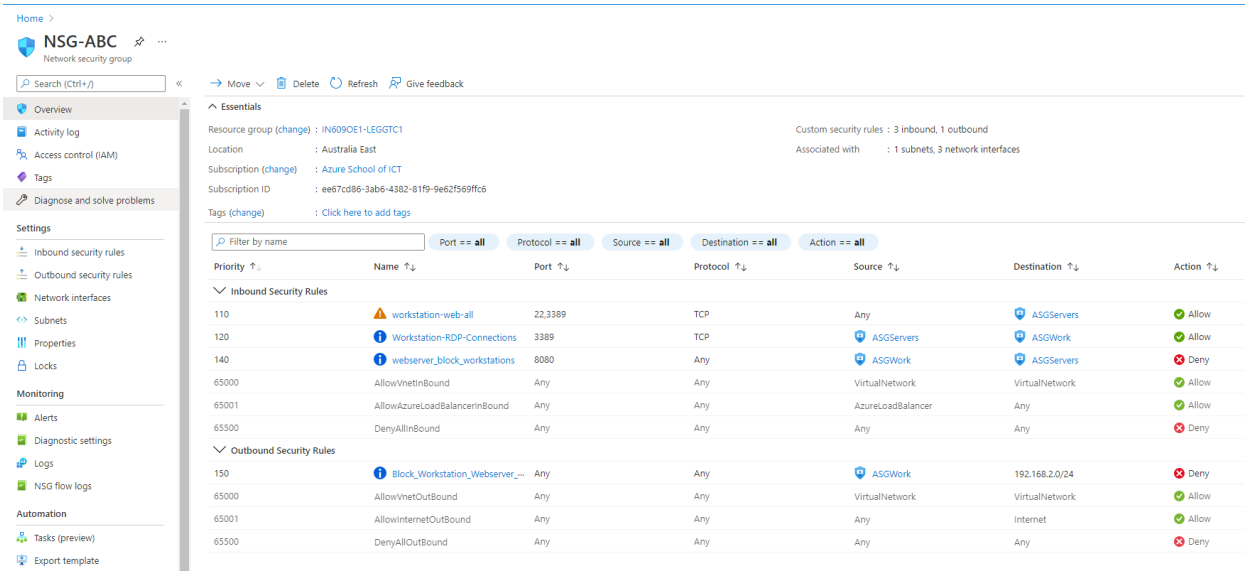


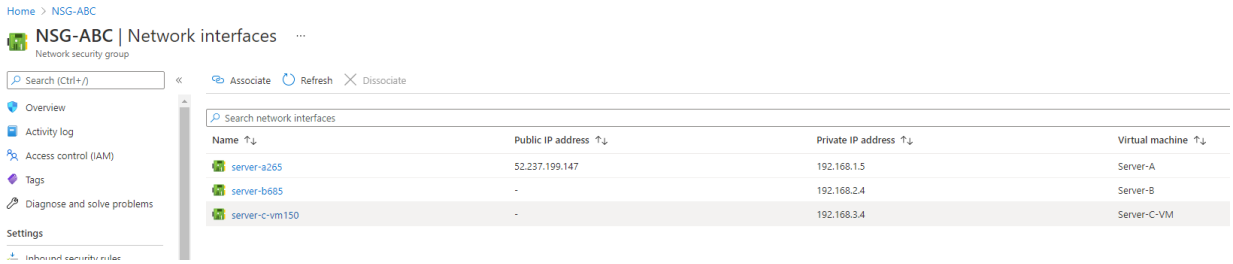
b. Application security Group ‘AsgWork’ for workstations.



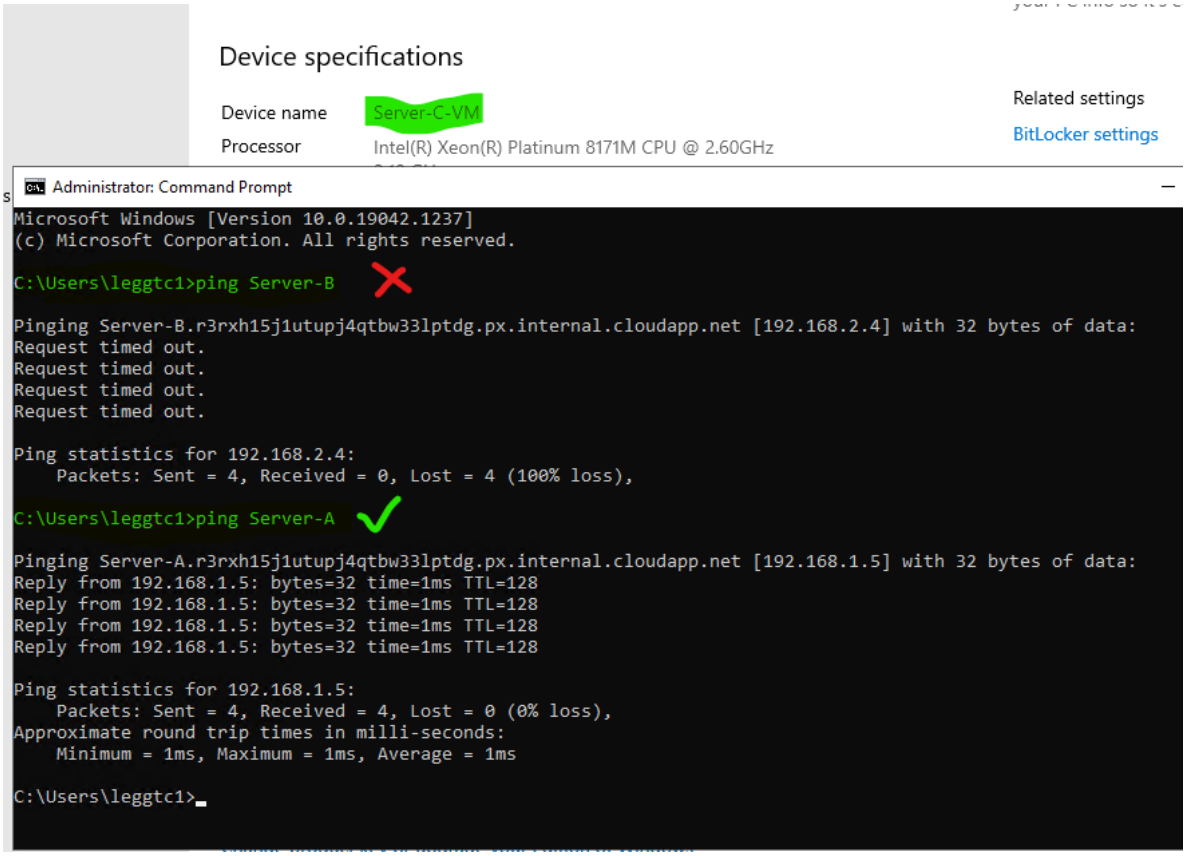


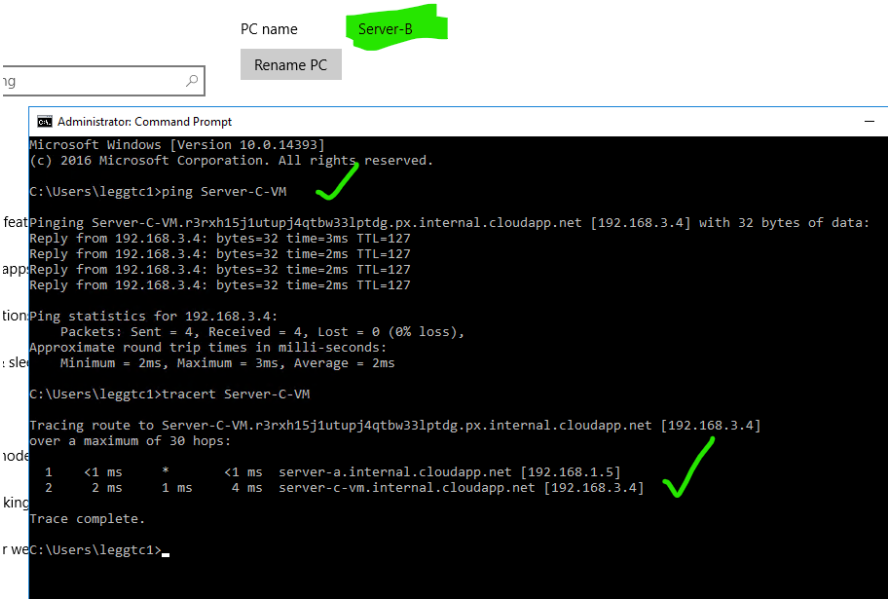
c. Network Security Group NSG-ABC for the organization.





d. Workstations should not have access to the webserver running on Server B.



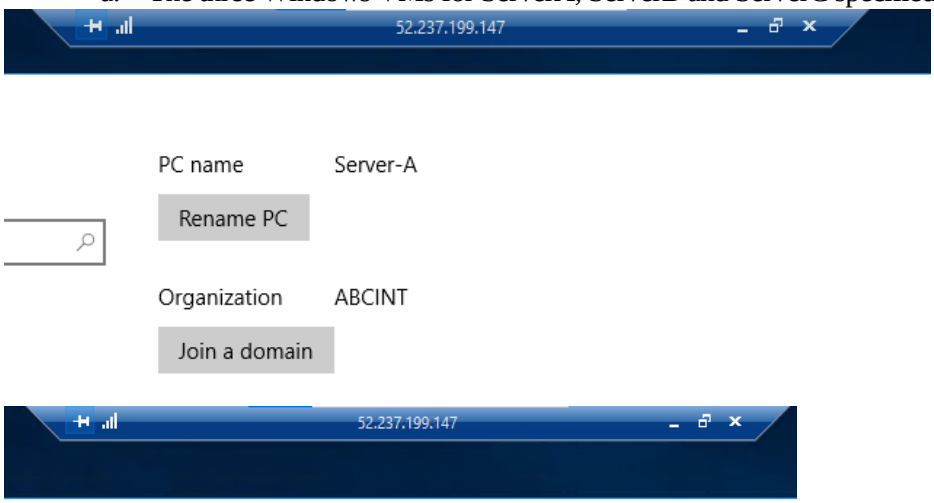


Submission: command execution/screen shot of created security groups

```
# ---------- THEN CREATE APPLICATION SECURITY GROUP FOR EACH SUBNET ---------- #

$ASGServe = 'ASGServers'
$ASGWork = 'ASGWork'

$AsgServer = New-AzApplicationSecurityGroup `
    -ResourceGroupName $RGroup `
    -Name $ASGServe `
    -Location $Loc

$AsgWork = New-AzApplicationSecurityGroup `
    -ResourceGroupName $RGroup `
    -Name $ASGWork `
    -Location $Loc
```

Task 3: Create VMs (3)

a. The three Windows VMs for ServerA, ServerB and ServerC specified on the Figure 1.



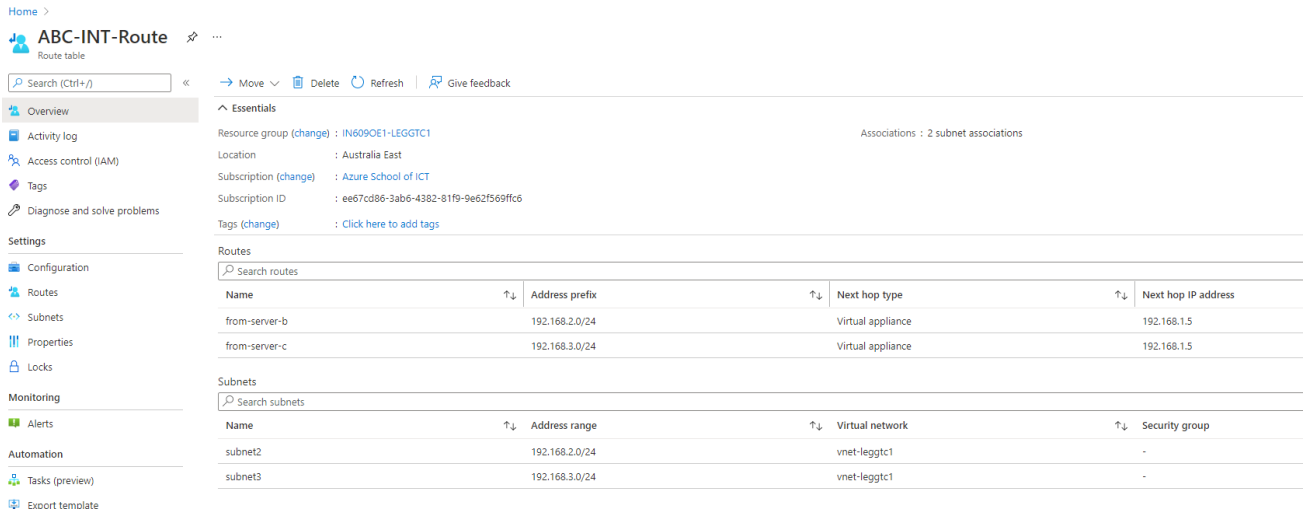
Submission: command execution/screen shot of created VMs

Task 4: Create Routing (3)

a. You need to create routing to route traffic from ServerB to ServerC via ServerA's router appliance.

b. Configure appropriate routing rules on the router appliance

Submission: command execution/screen shot of routing table



Task 5: Active directory Domain service (4)

a. ServerA must have active directory domain services enabled.

b. ServerB and ServerC must be member of the domain.

I tried to do this using the link provided to a tutorial that was made six years ago. The content was not even slightly helpful. It resulted in the network that was working up to this point to break; Using the information in the link my authentication to the server disappeared.

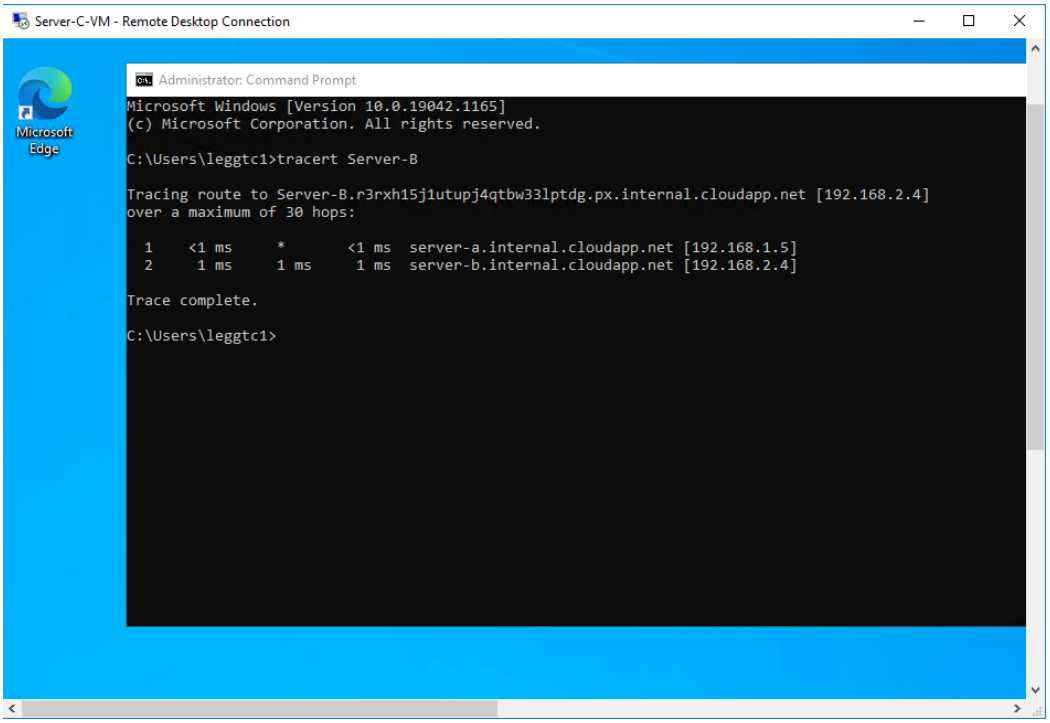
I still have no idea what the hell an active directory even does or why it is needed. Do we need to configure DNS and DHCP?? I have no idea because nothing outside of the completely useless link was provided in class.

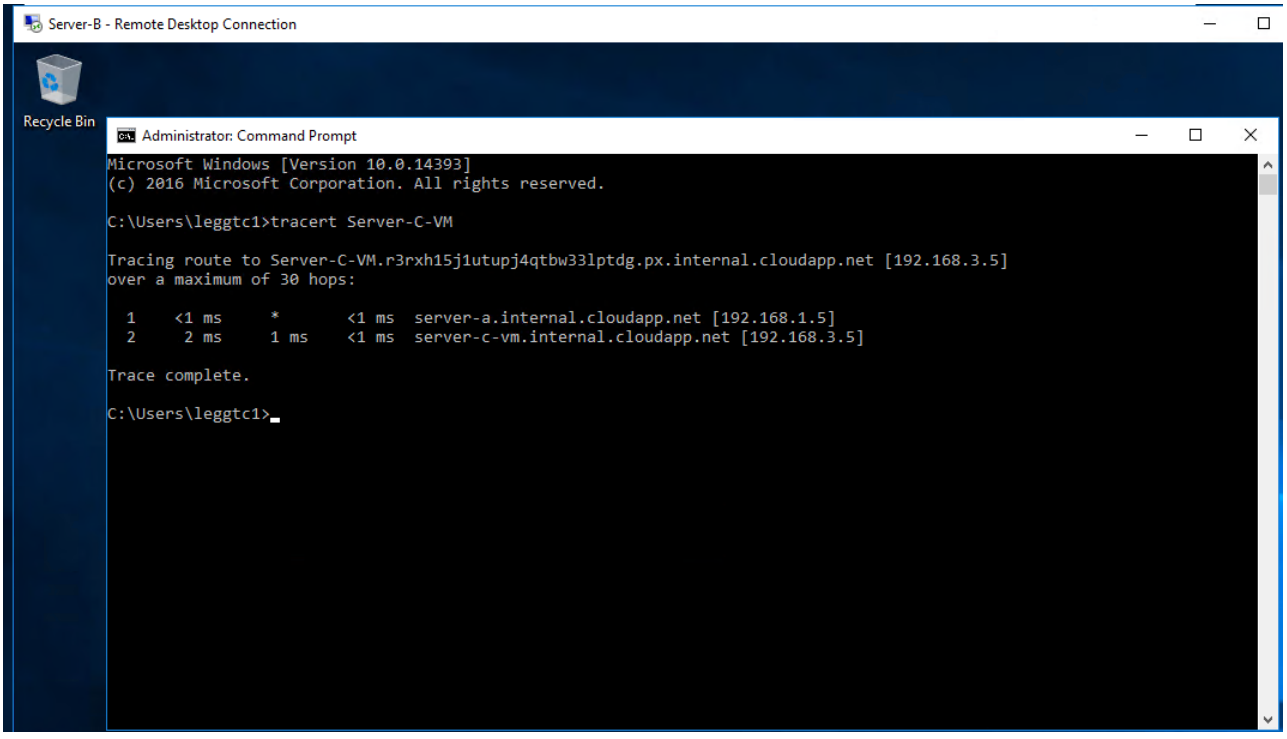
Cut my marks if you want, but I did not fail this task because I didn't try. I fail because that's how this assessment has been set up.

Submissions:

1. All the commands/scripts for the Tasks.

2. Screenshot of traceroute from ServerB to ServerC and vice versa, This should show the routes traversed.





3. Screen shot of RDP session from ServerB to ServerC and vice versa.

4. Screen shot of ssh session from your local computer to ServerA

5. Screen shot of RDP session from your local computer to ServerA on active directory domain.

You will need to include the above in a file and then submit it through Teams-Assignment tab